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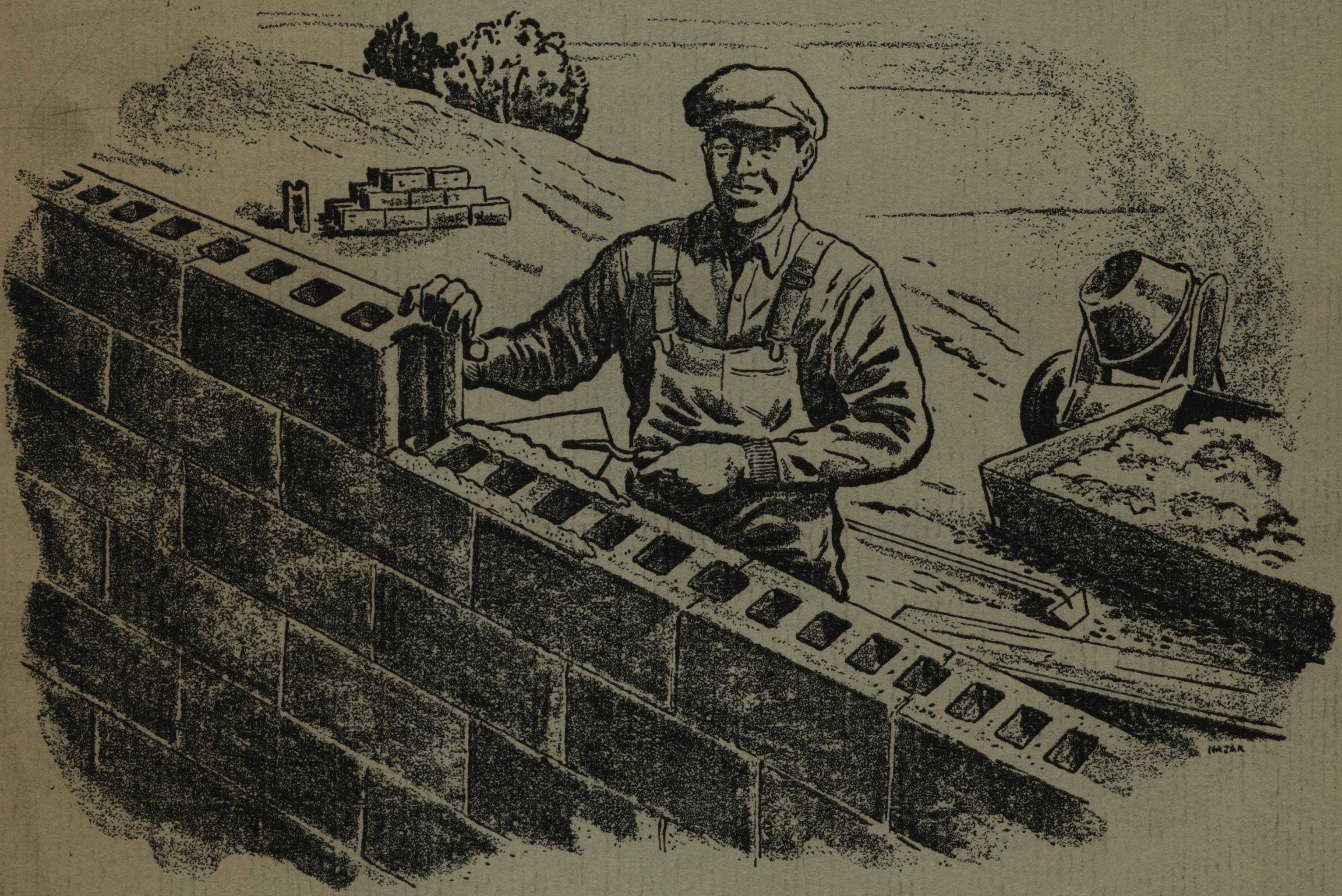
HOW TO BUILD YOUR OWN CONCRETE BLOCK HOME



PRICE $1.00

HOW TO BUILD YOUR OWN CONCRETE BLOCK HOME

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GENERAL ENGINES COMPANY
DREXEL BUILDING • PHILADELPHIA, PA.

DEDICATION

This book is dedicated to the millions of American people, who in this time of tremendous building costs and the greatest housing shortage in our history, are finding time through their own courage, initiative and ingenuity to build a major portion of their own homes. - - -

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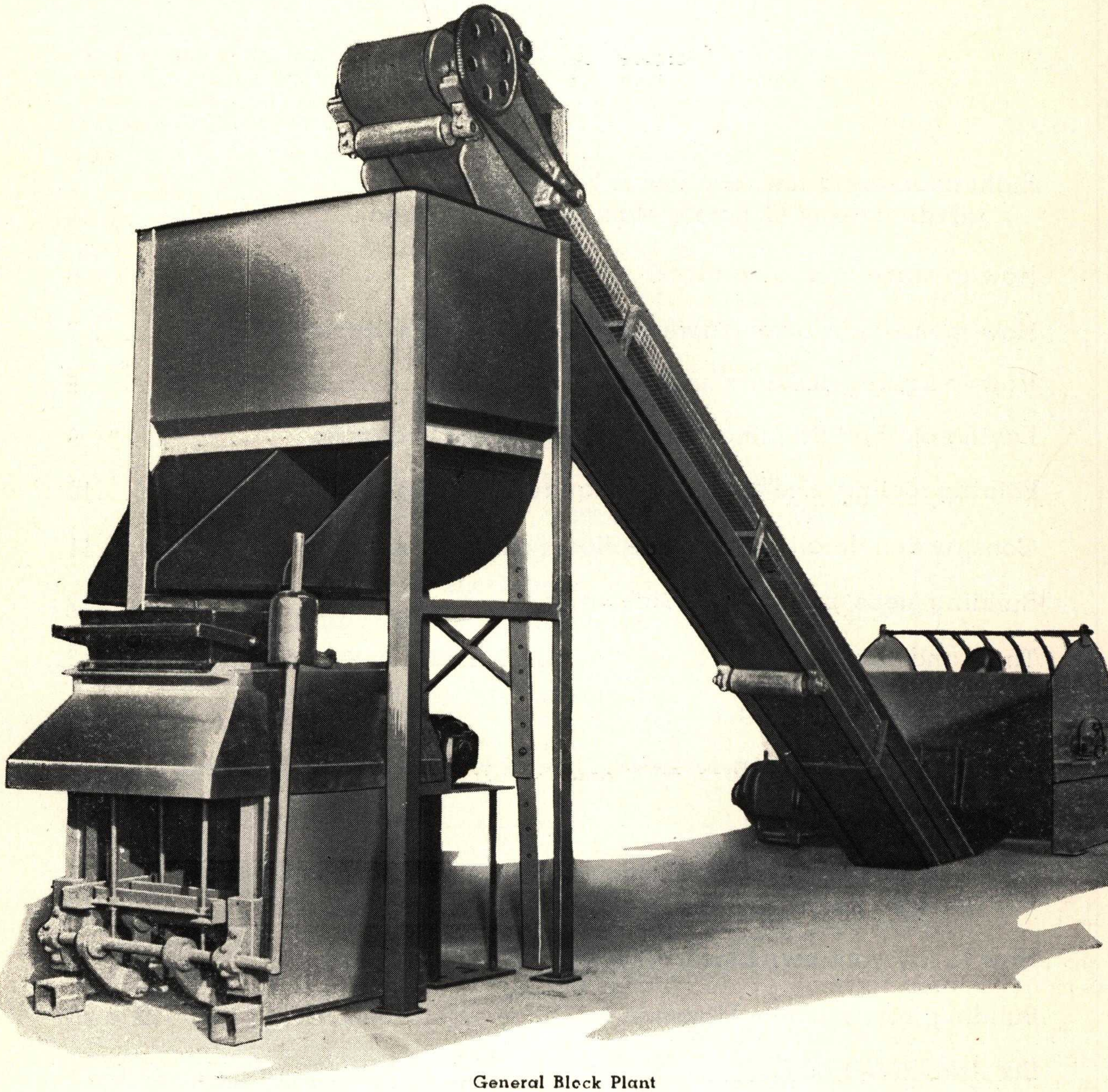


General Block Plant

How to save money on Building and Maintenance Costs

Eight important rules to follow:

1. Keep within your income. Build a house you can afford. Be sure your plans provide for additions as your present needs increase.

2. Do not plan fancy bay windows, alcoves and porches, but keep the outside of house as simple as possible.

3. Buy all windows completely assembled, including glazing, weatherstrip, storm sash and screens. This will save time and money on the job. We recommend an all-aluminum lifetime window.

4. Select plan for your present requirements. Living space is far more important than fancy layout and finishes.

5. Most of the simple work can be done as a hobby in your spare time. By following the instructions and formulas furnished in this booklet, there will be a tremendous saving.

6. Concrete masonery walls are fire-proof and cut maintenance costs. There are dozens of different attractive finishes that may be applied.

7. To avoid cutting of blocks, when planning house, the inside width of doors, window openings and outside dimensions, should all be multiples of eight inches.

8. Many modern builders by eliminating a cellar and using radiant heat in a concrete floor, have found this to be most economical.

Advantages of Concrete Masonry Homes

A concrete block home has several advantages over other types of construction. The cost of ownership involves two factors: that of building and maintenance. On both of these points the concrete block home has been proven the most economical.

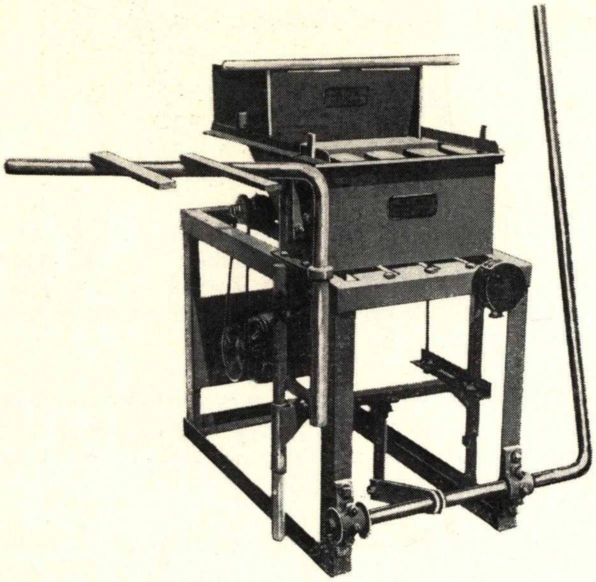
There are no annual paint bills, lower insurance rates, less fuel consumption, and a higher resale value. They are longer lasting, as there is nothing to rot out and termites are unknown. Long after your mortgage is paid off your concrete block house will remain in the same fine condition.

Concrete masonry homes are daily increasing in popularity because of their beauty. From the many different and attractive patterns and finishes, we have selected a few for illustration.

For all the year round comfort you will really appreciate your concrete block home, for while cool in summer it is equally warm in winter—heat loss being at a minimum. With this type of construction savings of one-third on the annual heat bill are not uncommon.

If you live in a region where violent storms are common, you will more than appreciate the strong rigid walls. Concrete masonry construction has long been recognized as preferred in these areas.

How to make your own High Quality Concrete Block with the General Concrete Vibrator Block Machine



General Vibrator Block Machine

Materials

The materials and the proportioning of them will be the basis of a successful operation and a growing business if they are handled correctly. They will have a very important part in the output of your equipment also. It is very difficult to set up any definite standard mix or proportions due to the wide variance in aggregate and local operating conditions. In the manufacture of concrete blocks there are two important factors that should be considered. The first being that your mixture should carry as much moisture as possible for ease in molding, for a quality product depends to a large extent upon there being enough moisture present during the initial set of the concrete to satisfy the requirements of the chemical reaction which is taking place. The second factor being that the block mix must carry as much coarse aggregate as possible because this is a determining factor in the amount of cement required and the strength of the finished product. The limiting factor in adding coarse aggregate will be in having sufficient fine materials to fill the voids, the finishing operation will also have a bearing on this.

In establishing your operation the most expensive material you use will be your cement. So your initial interest should be in determining your most economical mix consistent with a high quality product.

Aggregate: General

Aggregates should consist of sand, pebbles, crushed stone, cinders. slag or any of the prepared light weight materials or other approved inert materials or combinations of materials. The aggregates should be sound and free from dust or flaky particles. The aggregate should be free from any frozen material, alkali and acid in the form of moisture content.

Fine Aggregate

Fine aggregate will be considered any material that passes through a No. 4 screen (four meshes to the inch) providing that 15 per cent of the material will be retained on a No. 8 screen.

Coarse Aggregate

Coarse Aggregate will be considered material which will be retained on a No. 4 screen and pass through a 3/8-inch screen mesh.

Proportions

Our starting recommendations are that the operator use 40% coarse material and 60% fine material in a 1:6 mix. From this point, change the proportions of the aggregate to cement 1:7, 1:8, 1:9, etc. Samples should be taken from each of these trials. Mark them and cure them for testing after 28-day strength is reached. One bag of cement will make 20 regular 8 x 8 x 16 blocks. One cubic yard of cinders will make approximately 50 cinder blocks.

Water

Water should be free from oil and organic matter. Water which is fit to drink is usually used for mixing water. For cold weather, heated water will help appreciably in speeding the initial set of the concrete.

Excessive water content will make blocks slump. Not enough water will make blocks crack.

Operation

The General is a simple and easily operated vibrator type concrete block machine, requiring no skilled labor. The first operation is placing pallet in machine. Mold box is then filled with concrete. Block is vibrated fully, vibrator is stopped and block is then ejected from top of machine by pulling lever on right hand side in downward position. Block is then removed and you are ready for the next cycle. After a little practice you should have no trouble in producing two blocks a minute.

Many of the satisfied users of our General block machine have more than paid for their machines by first manufacturing the blocks for their own homes, saving 1/3 to 1/2 and then selling blocks to friends, builders and contractors thus starting a profitable building supply business.

Building is booming today as never before in U. S. history; 18,000,000 Americans are being educated on the advantages of home ownership. According to responsible estimates millions of homes are urgently needed, plus hundreds of thousands of stores, offices and factory building, public buildings, churches and farm buildings. It is estimated that we will be at least 15 years catching up with this tremendous demand, at the present construction rate of about one million homes a year. So here is a real opportunity to cash in on a busy rich paying field, in your own profitable business.

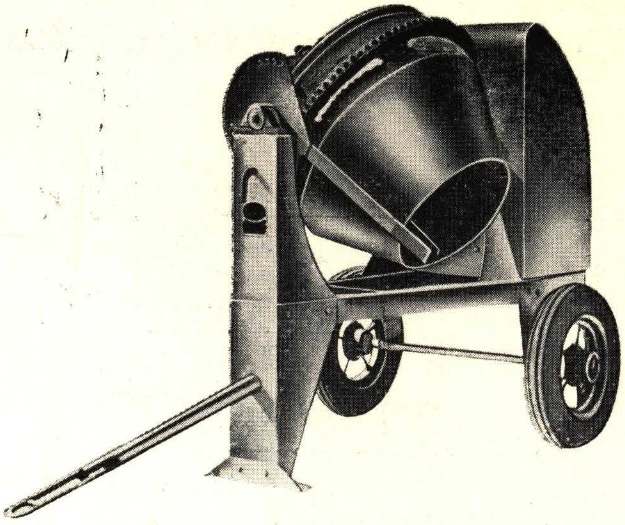
How to mix your own Concrete

Mixing Your Own High Quality Concrete With The General Mixer

What is concrete?

Concrete is a mixture of Portland Cement, fine aggregate, coarse aggregate and water bonded together in a rock-like mass. A few simple rules to follow for good quality concrete are:

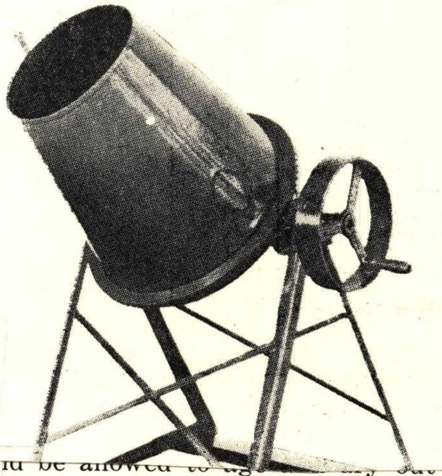
1. Use proper ingredients; water, Portland Cement and aggregate.
2. Correctly proportion the ingredients.
3. Mixing thoroughly.
4. Placing and spreading the mixture into correctly made forms.
5. Proper finishing.
6. Moist curing at favorable temperatures.



½ Bag Concrete Mixer

PROPER INGREDIENTS FOR CONCRETE

1. Portland Cement sold by dealers in 94-lb sacks, equals (1) cubic foot in volume.
2. Fine aggregate consists of sand and other suitable fine material smaller than 1/4 inch in size.
3. Coarse aggregate consists of gravel, crushed stone or other aggregate larger than 1/4 inch in size.
4. Mixing water should be clean. A good rule to follow, use drinking water. Correctly proportioning the ingredients. Most



its center will be exactly 8 feet from Stake A and exactly 10 feet from Stake F. The corner represented by the angle E-A-F is a right angle; the line A-E extended to D will form the second boundary line of the building and D will represent the third corner. Other corners are located in a similar manner. After this has been done, strings are stretched over the corner Stakes A-B-C-D and carried to outside supports called "batter boards" as indicated by G-H-K-L-M-N-P-R. The top of the horizontal batters should be set at the first floor level or some other convenient "datum." The building lines may be projected from the strings to the ground by means of a plumb bob suspended as shown in the drawing. When the outside Stakes G-H-K-L, etc., have been set and the strings

ly before materials which might be in-
d by dampness are placed on them.

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and

asphalt
fing felt
partitions
A
2" Deep continuous vertical trowel cut in concrete in center line of bearing partition
Metal reinforcement not

trench may be excavated. Nails should be driven in the batters where the strings are fastened so that if strings are broken or removed, they can be replaced accurately. Having found the building lines, it is easy to locate piers, posts, columns or other supports.

Bearing Strength of Soils

FOUNDATION SOILS	PER SQ. FT.
Rock, Granite	30 tons
Limestone (compact)	25 tons
Shale (soft rock)	8 to 10 tons
Gravel (dry coarse)	6 tons
Gravel (soft ")	4 to 6 tons
Clay (dry thick beds)	4 tons
Clay (dry soft ")	1 to 1½ tons
Sand (clean, dry and confined)	2 tons
Earth (solid and dry - natural)	4 tons

How to Figure Necessary Material Required

KIND OF CONCRETE WORK	Mix by Vol. Materials Cubic Feet			Workability of the Mix	Gals. Water per Bag When Mixing	One Bag Batch Makes This Much Concrete—Cu. Ft.	Materials for One Cubic Yard of Concrete			
	Cement Bags	Sand Cu. Ft.	Stone Gravel Cu. Ft.				Cement Bags	Sand Cu. Ft.	Stone Gravel Cu. Ft.	Gals. Water When Mixing
Footings, Heavy Foundations	1	3.75	5	Stiff	6.4	6.2	4.3	16.3	21.7	27.6
Water-tight Construction, Walls	1	2.5	3.5	Med.	5	4.5	6.0	15.0	21.0	30
Driveways Floors Walks (One Course)	1	2.5	3	Stiff	4.4	4.1	6.5	16.3	19.5	28.7
Driveways Floors Walks	1	Top 2 Bottom	0	Stiff	3.6	2.14	12.6	25.2	0	45.3
(Two Courses	1	2.5	4	Stiff	4.9	4.8	5.7	14.2	22.8	27.8
Pavements	1	2.2	3.5	Stiff	4.3	4.2	6.4	14.1	22.4	27.5
Water-tight Construction				Med.	4.1	3.8	7.1	14.2	21.3	29.3
for Tanks, Wells,	1	2	3							
Cast units like posts, slabs				Wet	4.9	3.9	6.9	13.8	20.7	33.7
Heavy Duty Floors, Barns, Shops, etc.	1	1.25	2	Stiff	3.4	2.8	9.8	12.3	19.6	33.9
Mortar for Brick, Concrete Blocks	1	6	1 Sack 50 ℔ Hydrated Lime	Med.	12.5	5.5	4.9	29.4	5	61.2

should be considered. The first being that your mixture should carry as much moisture as possible for ease in molding, for a quality product depends to a large extent upon there being enough moisture present during the initial set of the concrete to satisfy the requirements of the chemical reaction which is taking place. The second factor being that the block mix must carry as much coarse aggregate as possible because this is a determining factor in the amount of cement required and the strength of the finished product. The limiting factor in adding coarse aggregate will be in having sufficient fine materials to fill the voids, the finishing operation will also have a bearing on this.

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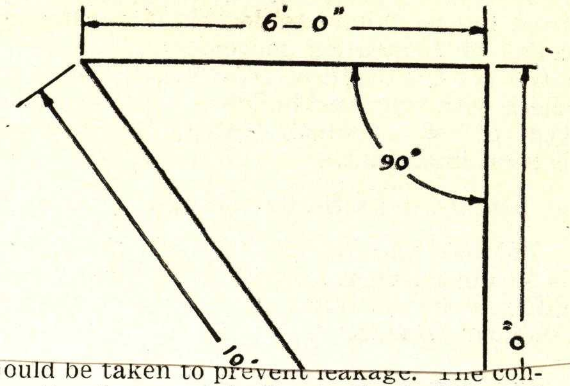
Laying out Building Lines

It will be found most economical to have the actual building lines established by a qualified and experienced builder. A small error made by a less experienced person may result in an expense several times that required for an expert's pay.

Where such expert service is not available it will be found that the easiest and quickest way of laying out building lines, when a transit is unavailable, is to use the 6-8-10 rule, together with batter boards at each corner of the excavation. This will insure square corners to work from as the 6-8-10 rule is based on the fact that a triangle whose sides are exactly 6-8-10 feet long is a right triangle—the angle opposite the longest side being a 90-degree angle.

LAYING OUT THE FOUNDATION

First, a base line is established, marking out one end or side of the new building. See line A-B in drawing. Stakes are set at A and B on this line, locating two corners. The top of Stake A a nail is driven near the center. This nail accurately locates the corner. On the line A-B another stake is driven at F, 6 feet from Stake A. A nail is driven in the top of this stake, exactly 6 feet from the nail in Stake A. Stake E should be driven so that its center will be exactly 8 feet from Stake A and exactly 10 feet from Stake F. The corner represented by the angle E-A-F is a right angle; the line A-E extended to D will form the second boundary line of the building and D will represent the third corner. Other corners are located in a similar manner. After this has been done, strings are stretched over the corner Stakes A-B-C-D and carried to outside supports called "batter boards" as indicated by G-H-K-L-M-N-P-R. The top of the horizontal batters should be set at the first floor level or some other convenient "datum." The building lines may be projected from the strings to the ground by means of a plumb bob suspended as shown in the drawing. When the outside Stakes G-H-K-L, etc., have been set and the strings



should be taken to prevent leakage. The construction becomes similar to the building of a tank except that external pressure must be provided against. It may be necessary to make the walls thicker and to place reinforcement in the walls and floor. Such cases require special design for walls and floor and should be handled by an experienced structural engineer.

In an area of extreme dampness we advise the following method of construction:

On a well-tamped fill of gravel, cinders or crushed rock having a thickness of six to twelve inches above grade, place a 1½-inch base course of concrete. This thin concrete layer is then leveled and left to harden. After it has hardened, place asphalt roll roofing or tough waterproof building paper on the con- base course, lapping and carefully ce- ing joints with mastic. Complete the by placing a top layer of concrete about inches thick. New concrete floors ld be allowed to age and dry out thor- ly before materials which might be in- d by dampness are placed on them.

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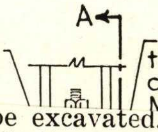
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Clay (dry soft ")	1 to 1½ tons
Sand (clean, dry and confined)	2 tons
Earth (solid and dry - natural)	4 tons

Pouring Footing

Be sure to place the footings below the frost line as failure to do this is a common cause of foundation movement. As most cities set the depth of frost line you should check with your local building inspector. The type of soil on which footings are to rest is most important.

See page 9 for Bearing Strenght of Soils

The best way to determine soil conditions is to dig an open pit and by observing the different layers determine the most suitable for your foundation.

	Cement Bags	Sand Cu. Ft.	Gravel Cu. Ft.
Footings,			
Heavy Foundations	1	3.75	5
Water-tight Construction,			
Walls	1	2.5	3.5
Driveways			
Floors			
Walks	1	2.5	3
(One Course)			
Driveways		Top	
Floors	1	2	0
Walks		Bottom	
(Two Courses	1	2.5	4
Pavements	1	2.2	3.5
Water-tight Construction			
for Tanks, Wells,	1	2	3
Cast units like posts, slabs			
Heavy Duty Floors, Barns,			
Shops, etc.	1	1.25	2
Mortar for Brick, Concrete Blocks	1	6	I Sack 50 lb Hy- dra Li

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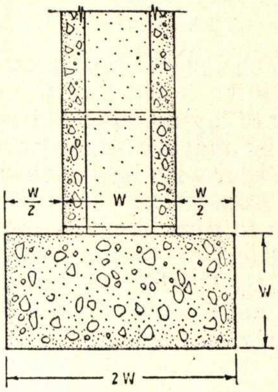
Typical design showing correct method of construction for water tight walls below grade.

WATER-TIGHT WALLS BELOW GRADE

It cost much less to build a water-tight wall than to repair a leaky one, consequently, the time to make a basement wall water-tight is when it is built. For concrete masonry foundations in ordinary well drained soil, the most important precaution is to see that the joints are well filled with cement mortar and carefully pointed. It always is not easy, however, to get first class workmanship, and in heavy water-logged soil the pressure of water may be great enough to force its way through construction seams. The following precautions will guard against the possibility of leaks developing through defective joints.

Typical design for cast-in-place concrete footing supporting concrete masonry bearing wall.



Similar methods are useful in repairing leaky basements and for insuring water-tightness in basements built of concrete masonry. In each case a line of concrete drain tile is placed entirely around the outside of the footing and is connected to a suitable outlet. The excavation above the tile is filled to within a foot of the grade line with soil, cinders or some other material of a porous nature to provide a fill that will allow water to seep through quickly. When the foundation is erected so near another building that it is impossible to run a line of tile around the outside, the tile may be placed on the inside of the footing and slightly below it.

When there is considerable water in the soil it often is advisable to place lines of tile both inside and outside of footings.

As a further precaution in securing a water-tight basement wall, two or more coats of Portland cement plaster may be applied to the exterior surface as soon as wall forms are removed, or in the case of a concrete block wall, just as soon as the mortar joints have hardened. The plaster is mixed in the proportions of one part cement to three parts sand. No lime should be used in plaster which will be in contact with the soil. Before applying the plaster, the surface should be dampened evenly to secure uniform suction.

Construction details of Concrete Floors on Ground

For economy in construction we recommend a plain concrete floor with the cellar eliminated. The correct mixture for your floor should be 1:2¼:3 with a depth of four inches. Not more than six gallons of water should be used for each sack of cement.

It is important that only a limited amount of water be used in the mix as an excess amount added to the cement paste which holds the mass of sand and gravel together, will be diluted and weak. Weak cement paste means weak, porous concrete, which is sure to be unsatisfactory.

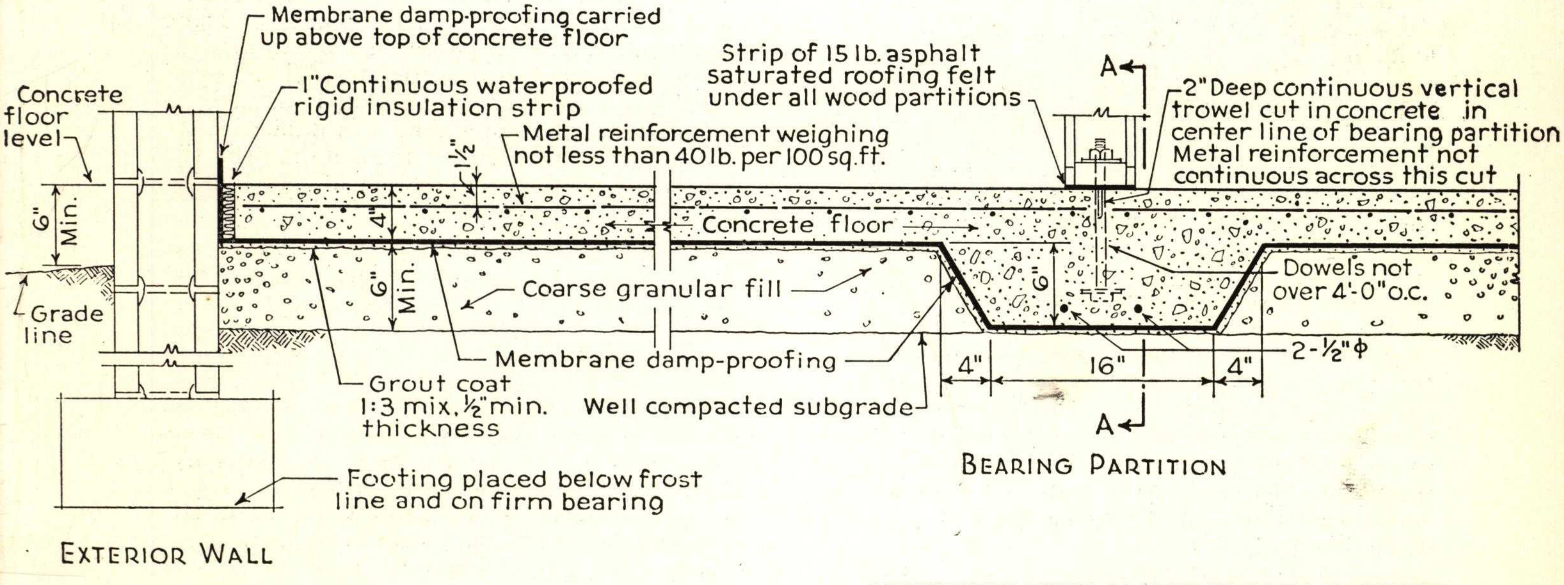
The concrete slab is usually placed on the earth. On soil which is water logged, however, a fill of cinders or gravel four to six inches thick and properly drained, should be placed to provide a dry base for the concrete. In either event, the base for the floor must be thoroughly compacted.

The surface of floors should not be finished at once but given time in which the concrete can stiffen after it has been placed and brought to the proper level. An attempt to finish at once may produce a film of mortar on the surface which has a tendency to check or crack. The proper time to finish the floor is when the concrete has stiffened somewhat but is still workable. Finishing is performed with a wooden float. With this tool, concrete is provided with a gritty non-slip surface. Where a very smooth surface is desired a steel trowel later is applied to the floated surface. The steel trowel forces sand particles down into the mass, tending to compact the concrete and leave the surface smooth.

Where the location of the basement is such that the ground water level is likely to rise above the floor level, further precautions should be taken to prevent leakage. The construction becomes similar to the building of a tank except that external pressure must be provided against. It may be necessary to make the walls thicker and to place reinforcement in the walls and floor. Such cases require special design for walls and floor and should be handled by an experienced structural engineer.

In an area of extreme dampness we advise the following method of construction:

On a well-tamped fill of gravel, cinders or crushed rock having a thickness of six to twelve inches above grade, place a 1½-inch base course of concrete. This thin concrete layer is then leveled and left to harden. After it has hardened, place asphalt roll roofing or tough waterproof building paper on the concrete base course, lapping and carefully cementing joints with mastic. Complete the floor by placing a top layer of concrete about three inches thick. New concrete floors should be allowed to age and dry out thoroughly before materials which might be injured by dampness are placed on them.


Membrane damp-proofing carried up above top of concrete floor
Concrete floor level
1" Continuous waterproofed rigid insulation strip
Metal reinforcement weighing not less than 40 lb. per 100 sq. ft.
1½"
4"
6" Min.
6" Min.
Concrete floor
Coarse granular fill
Grade line
Membrane damp-proofing
Grout coat 1:3 mix, ½" min. thickness
Well compacted subgrade
Footing placed below frost line and on firm bearing
Strip of 15 lb. asphalt saturated roofing felt under all wood partitions
A
2" Deep continuous vertical trowel cut in concrete in center line of bearing partition Metal reinforcement not continuous across this cut
6"
Dowels not over 4'-0" o.c.
2-½" ϕ
4"
16"
4"
A
Bearing Partition
Exterior Wall

CONSTRUCTION DETAILS OF CONCRETE FLOORS ON GROUND

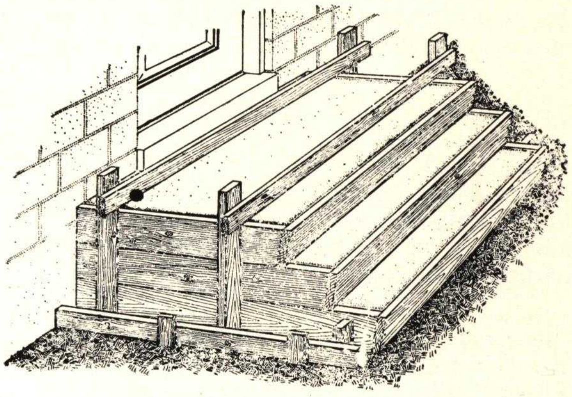
Building Steps, Porches and Sidewalks

STEPS

Simple to build, concrete steps are attractive and last indefinitely. Be sure that the tread of your steps is sufficiently wide and the rise is not too high for safety and comfort.

Forms for concrete steps may be built as shown. Two-inch lumber should be used for the side forms backed up with 2 x 2-inch cleats and rigidly braced as indicated in the drawing. Riser forms for steps should be cut from 2-inch lumber and braced when necessary to prevent bulging. Inspect forms carefully before you start concreting. Be sure that they are rigid and well braced. A little extra care at this point will insure a workman like, attractive job.

Use concrete that is not too wet. Fill first step and thoroughly compact and spade concrete. Then proceed with the remaining steps. Allow concrete to settle for one-half to three-quarters of an hour or until it begins to stiffen. Then level off the concrete and finish with a wood float. The tread should be rounded with an edging tool.



Method of building forms for concrete steps. Note that riser form boards are tilted in at the bottom about 1 in. to provide additional toe space on the treads.

WALKS

If soil is not well drained, a 6-inch sub-base of well-compacted gravel or cinders should be provided. Concrete for ordinary sidewalks should be 4-inch thick—driveways, 6 inches.

Usually 2 x 4's held in place by stakes are used for forms. The surface of walk should be one inch above grade and pitched 1/4 inch for drainage. The same mix is used for the full thickness. Expansion joints, 1/2 in to 3/4 inch thick and extending the full depth, should be placed at all points, where the walk butts curbs or other fixed objects. Walks should be divided into sections about 4 foot long. This is done by cutting a groove in the concrete about 3/8 inch wide at right angles to the side of forms. The groove can be cut with an ax or piece of metal which can be driven into the fresh concrete about one-third the thickness of the slab and then remoxed. The groove should be finished with an edging tool.

PORCHES

Concrete Porch Floors

Where the new concrete porch floor is to be two foot or less above the general ground level, a simple slab built on a fill, makes an excellent floor. The fill of gravel crushed rock or cinders which supports the floor should be well tamped before placing concrete. The concrete floor is usually built to four or five inches thick and should be reinforced as a protection against possible cracking due to uneven settlement. It is also important that the thickened edges of the concrete slab be reinforced with two 1/2-inch round reinforcing bars. This construction makes a reinforced concrete beam which spans the distance between supporting piers. The piers are made by filling 8-inch post holes with concrete. At laps the ends of 1/2-inch round bars should extend past each other about 2 foot. The porch floor should be sloped about 1/4 inch in 1 foot to provide good drainage. Where the porch floor is 2 foot or more above the ground level, it should be made of reinforced concrete supported on continuous foundation walls.

Then and Now

During the early days of this nation men were confronted with the same problem that continues to haunt many of us today. That is—where to live? How, midst a host of difficulties, to provide a safe, secure and comfortable home for our families and ourselves. Pioneer families met this problem with primative, rough hewn tools and only the crude materials provided by nature. They did it by way of back breaking labor and dogged perseverance in the face of what must have seemed insurmountable obstacles. They found the courage and initiative to do this because of the simple fact that it **had** to be done—there was no other way. For us to consider ourselves in the same situation as these hardy home builders of another age may, at first glance, seem rather far fetched. However, upon closer examination and after some sober reflection, one soon realizes that the real, basic problem is after all, not a very different one. Early settlers carried out their home building plans under the most adverse circumstances. Not only were their few and inadequate tools and materials, but they were constantly exposed to both the elements and the danger of Indian raiders. The physical hardships they endured were certainly more severe than any we are likely to encounter today. But it is nevertheless true that young families of our day face harsh realities which can be very dangerous indeed when one considers that most of us are people of modest means. Indian raids of course, have long since ceased to be a problem. But the raids made on the average man's meager resources by ever soaring prices certainly constitute an equally real threat to his security and well being. Particularly is this true when we consider the housing situation. In order to assure himself of adequate housing, he is soon forced, like his forefathers, to turn to his own ingenuity and resourcefullness. In housing, there are only two methods by which we may overcome the tremendous pressure of high prices. The first and most obvious solution is to progressively increase our personal income so that we are able to continue to meet rising costs in all quarters. Unfortunately most of us are required to operate within the ridged limitations of our earnings. Also, most of us would find it difficult if not impossible to so increase our earnings that we would find ourselves able to pay inflationary prices.

The only course then open to the man of average income, is to secure a plan or means by which he may by-pass high costs wherever and whenever it can be done. We are convinced that this book con provide an answer to at least one phase of this perplexing problem. If you will utilize to the fullest extent the suggested methods and facilities contained in this publication, the saving you will make on your over-all building out-lay will, we are sure, justify the time and effort required in the process. There is no reason to suppose that we today are less resourcefull than were our pioneer ancestors.

With the facilities and materials readily available to the home seeker today, the early settler might have considered his task unbelievably easy. True, the wise builder must still do a lot of careful thinking and planning, for building a home is, and always has been a serious undertaking. But few accomplishments are as rich in personal satisfaction as planning and building your own home. Knowing it's construction as only the builder can know it and confident that with it's selected material and personal workmanship it will endure.

But how to go about this seemingly complicated task? It is not easy of course—nothing worthwhile ever is. But using methods and materials made available in this modern age, there is no reason why a man of average intelligence cannot, if he applies himself, build a strong, secure and attractive home of which he and his family may well be proud. We don't mean to suggest that a **complete** home, down to the last detail can be successfully built by one inexperienced person. Some of the work will be better left in the hands of competent craftsmen. Plumbing, electrical wiring, etc. usually are required to meet certain standards and we recommend that they be installed by licensed mechanics. However, these things form only a small part of your total cost for building. By planning and carrying out the actual building of the home itself, **yourself**, you will save more than enough to meet the cost of whatever skilled labor you may require after the structure has become a reality.

The common sense simplicity of building in concrete makes this possible and practical for all men regardless of experience or background. A careful study of the drawings, illustrations, suggestions and directions in this book should enable you to successfully deal with all difficulties. We believe this method to be both practical and economical. If properly followed and applied it will assure complete satisfaction in your home building venture.

Thinking and Planning

Long before the actual work on your new home is begun, you should do a lot of serious thinking and planning. Though your home may be urgently needed, you will not want your decisions on what to build to be the result of snap judgement. Probable expenditure should be carefully estimated and balanced within your budget; various ideas and suggestions accepted or rejected; finally when you have what you want, it should be the best possible house for you at the overall cost you feel able to afford. For most of us the all important question will be economy: How can I cut costs and still get a high quality product? We have already stated that concrete construction is one answer. There are several reasons with which this fact can be clearly established.

Let us consider what the situation would look like if we proposed to build an ordinary, wood-constructed home. Due to the severe housing and building shortage, lumber of all types is, and from all indications, will continue to be scarce. The lumber that is available is procured and processed into building units at great expense; all this is immediately reflected in retail prices which are so high as to be beyond the reach of the average person. Concrete materials, on the other hand, are easily and quickly obtainable. Not only is this true but you can completely by-pass the costly heavy processing operation by making your own concrete blocks and pre-castings. For a surprisingly small sum you can purchase your General Concrete Vibrator Block Machine. This machine is simple, inexpensive and easily operated. Using only your spare time, you can amass a stock pile of concrete block in a shorter period than you ever imagined. If you are able to devote a full eight hour day to this machine, you can easily turn out 1000 blocks per day. Since these blocks will be the main ingredient in your new concrete home, you can readily see the importance of this point in cost cutting. You will actually save from one-third to one-half on this item alone. As we pointed out earlier, initial outlay for this machine is so low that it soon more than pays for itself. In other words you are getting a material for building which is superior in every way to wood; and you are getting it for less money. Sounds unbelievable doesn't it? But we assure you that it is true. Any responsible construction man will agree that concrete is the most durable, safe and generally satisfactory material for the building of homes—or for that matter many other type structures.

On page five there are listed several advantages to be found in concrete masonry homes. Perhaps a further explanation of some of these points will be useful and revealing. First, let's consider termites. If you planned to build a wood constructed home you would have to consider them for these tiny, ant like creatures infest just about every state in the United States, inflicting untold damage to all types of wooden structures. A termite likes nothing better than eating celulose. Since celulose is the principal substance in wood, it is readily apparent that the easiest and simplest way to eliminate termites is to eliminate wood wherever possible in your building plan. Concrete construction is never attacked by these damaging insects, and wherever employed, constitutes an impregnable barrier to protect what interior wood finishing you may wish to use. Concrete is termite-proof, therefore this important item in depreciation and up-keep cost can be forgotten in concrete construction.

Another point can be summed up very simply—wood will burn—concrete will not. Fire hazard has always been a major concern of all home owners and a continuing expense in insurance coverage. Concrete construction will cut insurance rates to an absolute minimum by providing a maximum of fire immunity. Properly insulated concrete will give you more solid, year around comfort than any other type construction known. Heating costs will be held to a minimum because of the low heat loss in concrete. It is generally agreed that concrete construction will offer a more rugged and reliable resistance to wind and weather even in the most severe climatic conditions. Yet it is so easily handled both in design and construction that any kind of house a builder wants is obtainable. A remarkably wide variety of decorative designs and finishes, both inside and out, are possible with this extremely plastic material to work with.

Outside wall surfaces may be finished in many different styles ranging from stucco to concrete brick. A good paint job will last in excellent condition from 2 to 3 years longer than the same job would on a frame base.

There is a literally unlimited range of ideas and possibilities for interior decoration, including highly polished, cement finished floors which look as well and will out last hardwood, unusual and attractive fire place designs, many beautiful wall patterns and finishes, etc.

You may purchase, for a very small outlay our General Concrete Mixer, a compact, inexpensive and highly efficient little machine with which you can tackle almost any type work. With this mixer and your Block Machine, you are prepared to build your own Concrete Home to any specification you need or desire. This is sure to be an unusually sound investment for if you should so desire, after completing your home, ready sale could be found for either or both machines. Families finding themselves in the same position regarding home needs, might very well pool resources and provide their own materials even more easily by combining efforts to effect more substantial reductions in cost. These and other suggestions and directions, tables and formulaes found in this book deserve your earnest attention and study before embarking on your home building venture.

Other Type Construction

While the primary purpose of this book is to attempt, by listing and explaining the various advantages of concrete masonry construction, to assist the ordinary home seeker in solving his problems, there are many other types of construction on which the principles supplied herein may be successfully and profitably applied. Farmers and dairymen will find this book particularly useful in planning and building barns, implement sheds, poultry houses, etc. Virtually every type building necessary to modern farming can be built better, dryer and at much lower cost by the use of concrete construction. For the small investment required to provide himself with the General Block Machine and Concrete Mixer, the enterprising farmer can effect savings in building costs which may run to many hundreds of dollars. Even in simple type structures, for example, the garage, the economy of building and superiority of product are obvious. The farm automobile or truck, the tractor, or even the general workshop are easily and securely housed in this type building. The same factors which make concrete the most desirable material for home construction will hold equally true in other projects; no fire risks, long life, small out-lay for up-keep and an over all solidity and attractiveness are features which make concrete building a really advantageous thing for the businessman farmer. There are so many jobs that will be completed more easily and efficiently by employing these two inexpensive machines, that the farmer might soon consider them to be essential equipment, as useful and money-saving as his tractor or reaper. A properly built concrete structure will prove servicable for years more than a lifetime. For this reason the various buildings should be carefully planned out on paper before any work is begun. But once in possession of what appears to be the best plan—considering basic design, floor space, doors, windows, etc., construction may be carried out with the complete assurance that what you are building will remain in excellent condition long after ordinary wood structures would have had to be torn down and replaced. The many type buildings necessary to the farmer, i.e. corn crib, granary, milk houses, storage cellars, in fact a virtually endless list of projects small and large will be better and more lasting when completed in concrete construction.

The practical businessman also, will find if he studies the advantages in this type work, that his warehouses, loading platforms, garages, and in fact, any of his functional buildings can be built better for less money with concrete masonry. New and expanding firms or organizations will find that this will require considerably less money invested and even more money saved in eventual insurance and up-keep.

Service Stations, in which concrete has always played a large part, can be literally built from the ground up with this material. With the many unusual designs and patterns possible, a really attractive business site can be inexpensively built. This is bound to mean an increase in volume of business and of course a corresponding rise in net profits. Anyone considering a business venture of this type, would be well advised to make the small investment necessary to secure the services of the General Block Machine and Mixer. Driveways, aprons, pump islands, greasing pits, inside floors, storage space: it is difficult to imagine anything connected with a gasoline service station that would not be better and more solidly built and assure a greater margin of safety against fire when constructed in concrete.

There could be no greater boon to the small business man who must work with limited capital. Whether your proposed venture be a roadside restaurant, tourist cabins or a simple merchandise establishment, the advantages and short-cuts made possible with concrete masonry construction are clear and unmistakable.

The use of plans which are approved by building specialists can do much towards assuring you of the kind of building needed and insuring that the many small but important features are not overlooked.

Since every known analysis of building materials most generally in use only serves to emphasize the all around superiority and economy of concrete, logic and common sense must lead you to the decision that this material is best for your building venture, be it a new house or any other type structure. The pictorial sequences beginning on page fifteen need not be confined to the building of a residence. Since the basic principal of most structures is the same or is closely similar, these graphic illustrations may be easily and profitably applied to many other projects. The man of real imagination and resourcefullness should find this book an invaluable aid to his building project whatever or wherever it happens to be. We know of no one who ever had course to regret turning to concrete construction to carry out his building plans. Superior buildings for less money—can there be a better recommendation?

Business Opportunities

After reading of how a product which is in heavy demand can, by his own individual efforts, be quickly efficiently and **inexpensively** produced, the inteligent and enterprising man will immediately conclude that this in itself should and could be the beginning of a live, profitable business. The conclusion is entirely justified. Using only the General Block Machine and General Mixer, there are so many and widely separated means by which the ordinary man can assure himself of substantial and continuing profits, that a whole book would be required to present them adequately. In this section we shall try to present a few ideas which deserve your consideration. Let us assume that, planning a concrete home, you have invested in these two inexpensive machines. Your home completed, you find that the reduction in cost has more than paid off your original investment in the machines. Now if you wish you can dispose of these economical aids and realize what will amount to a clear profit on the whole deal. But after further thinking you may decide that, with millions of Americans seeking urgently needed housing, there is a very real opportunity to turn even your spare time into solid profit. You already have your newly completed concrete house. This will prove the best advertisement possible. If you don't have sufficient time to devote to the necessary labor, it is possible and extremely profitable for you to rent your General Machines to many of your friends and neighbors who find themselves in the position you so recently were yourself. This will realize a fair profit for you and will effect the same savings in cost for your friends that you yourself enjoyed.

You may decide to concentrate on the production and sale of concrete block. There is an increasingly heavy demand for this basic building unit. The cost of required materials, cement, sand and aggregate will be low—so low that profitable sale of your product will be quick and easy. The experience and practice gained in building your new home will serve you well in this venture. You will find, as you proceed, that the know-how you acquire will continue to present newer and improved set-ups for your machine which will result in increased production. The possibilities in this branch alone are promising enough to arouse the interest of ambitious and energetic men all over the country.

There is a wide and fertile field opening in which iniative and some imagination will reward the aspiring business man more quickly than he ever believed possible. We refer to the great selling possibilities of the various art designs which a plastic material like concrete make easy. Bird baths, lawn ornaments, even interior decorations can be and are being designed and manufactured by ordinary men with confidence in their own ingenuity and ability. This interesting and highly profitable business is open to anyone with enough imagination to realize its tremendous opportunities. Many original and highly individual designs are readily developed. With your time and labor saving General Mixer, you can soon produce your ornaments on a scale which will guarantee a satisfactory margin of profit. A clever and resourceful man can very easily design and fashion molds for the production of countless interesting and quickly salable figures.

There are less artistic but no less profitable fields to be explored in the contracting for, and laying of driveways, sidewalks, curbing, etc.

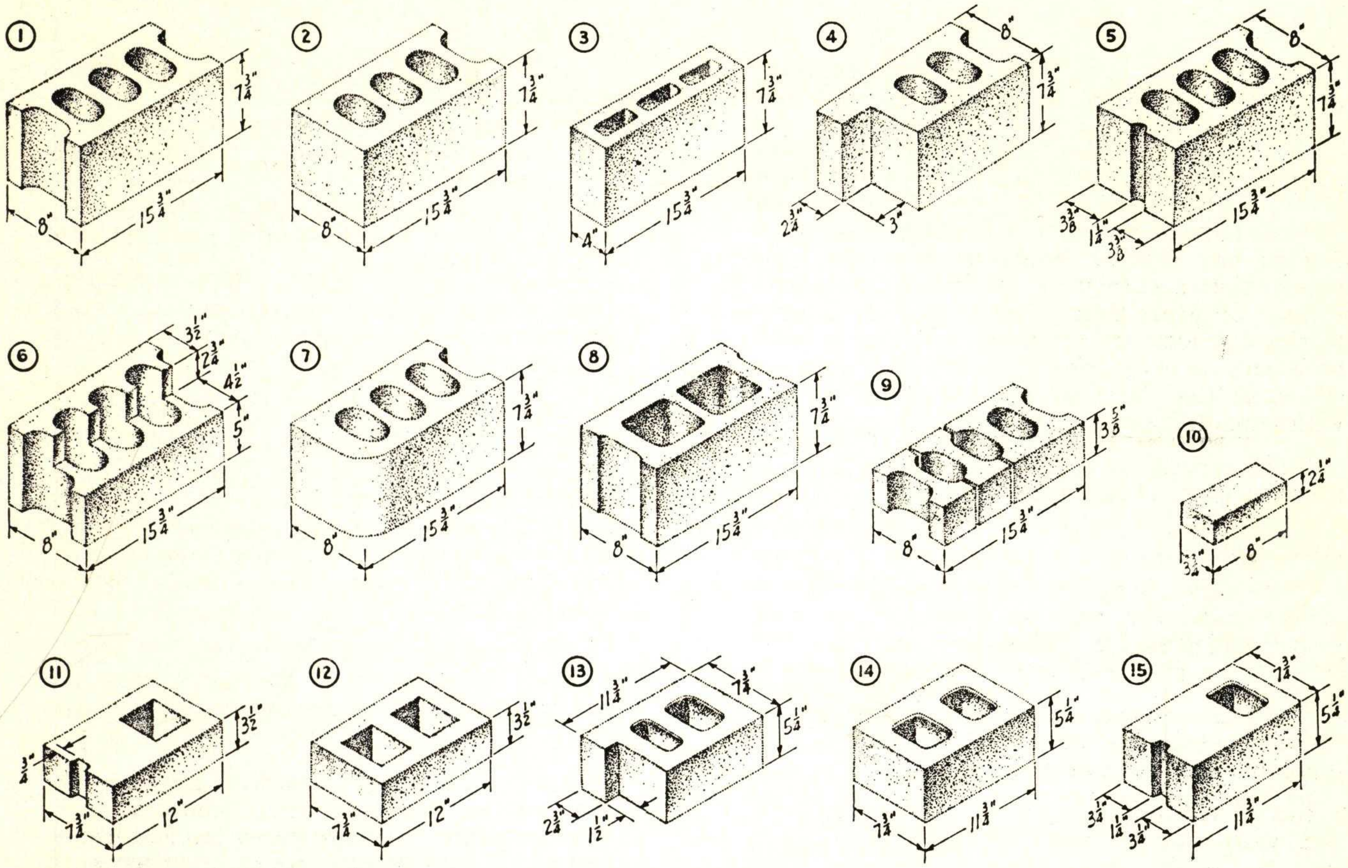
Many boat enthusiasts will find concrete boat houses, pier foundations and dry docks both less expensive and far more servicable. The superiority of concrete in this type work is soon made apparent when one considers the rotting effect of water on wood.

As mentioned earlier, any attempt to list **all** the practical and realistic business enterprises possible and feasible for the concrete conscious man would call for far more space than we have at our disposal in this concentrated publication.

We can only repeat and emphasize that you, the average man, can successfully launch a business in any one or more of these lines. All it takes is a little courage, energy and the ordinary perseverance required of us in any venture that is to be based and conditioned on the individual effort we are willing and able to make.

In the rapidly expanding economy we live in there are countless opportunities for the ambitious man. We believe that many of them are to be found in concrete construction and it's many by-products.

COMMON SHAPES AND SIZES OF CONCRETE MASONRY UNITS



Common shapes and sizes of concrete masonry units. (1) Three-core, full length block. (2) Corner return block. (3) Partition wall block. Also used in double wall construction. (4) Door and window jamb block for wood sash and frames. (5) Jamb block for metal sash. (6) Header block to back up brick and other facings. (7) Bullnose block for streamlining corners. (8) Two-core block available in some areas. (9) Half-height block for ashlar walls. (10) Concrete brick. (11) Jamb tile for metal sash. (12) Full-length tile—3½ in. (13) Jamb tile for wood sash and frames. (14) Full-length tile—5¼-in. height. (15) Jamb tile for metal sash. As shown in the drawings, actual dimensions are less in length and height than nominal dimensions. Units are generally manufactured to allow for a ¼-in. 3/8-in. or ½-in. mortar joint. Designers should contact local sources of supply to determine dimensions of units available. Even dimensions are convenient in laying out the building and in using stock sizes of windows, doors and other millwork. Units shown are available in half lengths and frequently in quarter and three-quarter lengths to save cutting on the job. Units (1), (2), (3), (4), (5), (6), (7), (8) and (9) are also available in 6-, 10-, and 12-in. widths. Units (11), (12), (13), (14) and (15), in 4-in. width.

CONCRETE BLOCKS REQUIRED FOR 100 SQUARE FEET OF WALL SPACE

Description (Hollow Partition Block)	Wall Thickness	Weight Per Unit (lb)	Number of Units (per 100 sq. ft. of wall area)	Mortar* (cu. ft.)	Weight, lb (per 100 sq. ft. of wall area)
8 x 8x 16 inches	8 inches	50	110	3.25	5850
8 x 8 x 12 inches	8 inches	38	146	3:50	6000
8 x 12 x 16 inches	12 inches	85	110	3.25	9700
8 x 3 x 16 inches	3 inches	20	110	2.75	2600
9 x 3 x 18 inches	3 inches	26	87	2.50	2500
12 x 3 x 12 inches	3 inches	23	100	2.50	2550
8 x 3 x 12 inches	3 inches	15	146	3.50	2550
8 x 4 x 16 inches	4 inches	28	110	3.25	3450
9 x 4 x 18 inches	4 inches	35	87	3.25	3350
12 x 4 x 12 inches	4 inches	31	100	3.25	3450
8 x 4 x 12 inches	4 inches	21	146	4.00	3500
8 x 6 x 16 inches	6 inches	42	110	3.25	5000

* These figures are based on 3/8 inch mortar joints, 25% wastage included. Weight of mortar assumed at 103 pounds per cubic foot. For 1/2 inch mortar joints, use one-fourth more mortar than specified in the table.

How to lay Concrete Block

With the footings in place set up and clean ready to receive the foundation walls, the inexperienced mason may draw chalk lines on the footing to indicate the exact position of the first course of blocks.

Blocks are now placed, without mortar, all around the footing. This enables you to check the accuracy of your dimensions. Rarely, if ever, will the blocks and joints works out exactly right. It will be found necessary to move the blocks one way or another, so that the last block fits into place with enough space at each end for the joints.

Build corners two or three courses high, then stretch chalk lines between corners along outside faces to serve as guides in laying the walls.

Place a double row of mortar on the footing or foundation wall as shown in accompanying illustration. This provides what is called "face shell bedding."

Next press concrete masonry units carefully into the mortar with the outer edge touching the chalk or guide line.

Butter vertical edges of units with mortar and shove firmly against unit previously placed. Where large units are used it is customary to stand them on end and butter edges before placing in wall.

Vertical joints should average about 1/4 to 3/8 inch thick. Horizontal or bed joints should not be more than 1/2 inch thick and should average about 3/8 inch thick. Excess mortar which is squeezed out between joints as the units are placed should be struck off flush with the wall surface with a trowel.

Always lay concrete blocks "top side up" A glance at the block will show that the edges and webs are thicker on top side than on the bottom.

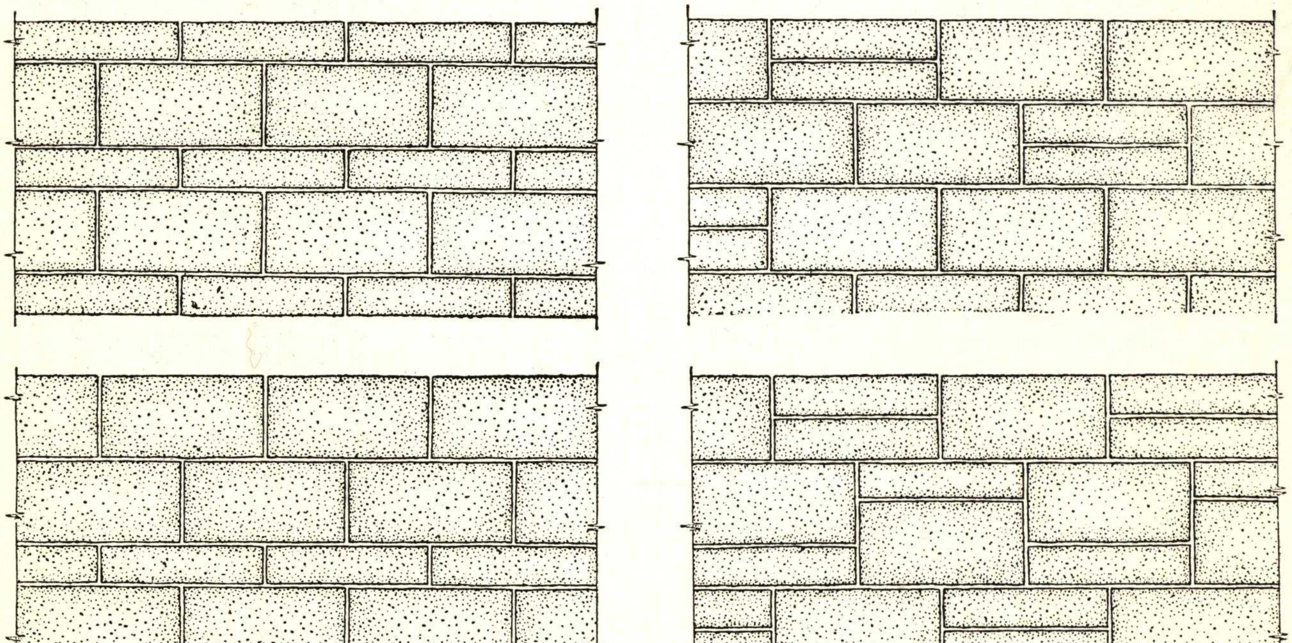
Use a three-pound lump hammer to tap the block into place. Be sure to check each block to make sure it is plumb, level, and square with the line and wall.

After mortar has become quite stiff, it should be pointed with a small trowel or rounded pointing tool which compacts the mortar, pressing it firmly against the concrete blocks. This helps produce tight, strong joints.

The blocks must be kept dry until laid in the wall.

Be sure to leave out blocks for any openings for cellar doors, chimney foundations, etc., if they are to be near the level of the cellar floor. Half blocks will be required at all wall openings.

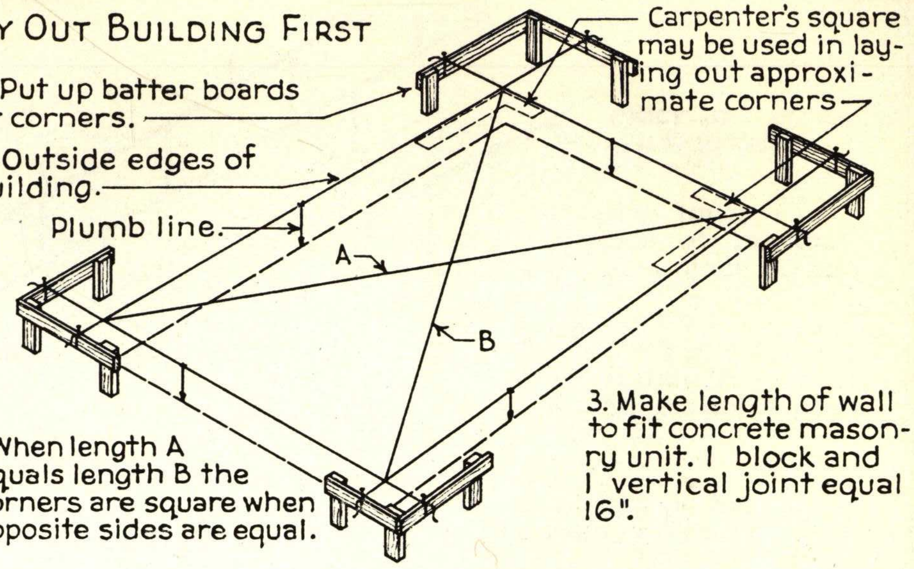
MANY ATTRACTIVE PATTERNS CAN BE PRODUCED WITH CONCRETE MASONRY



Building from Concrete Masonry

A pictorial sequence showing the actual step by step procedure in building a Concrete Masonry Home.

LAY OUT BUILDING FIRST



1. Put up batter boards at corners.

2. Outside edges of building.

Plumb line.

Carpenter's square may be used in laying out approximate corners

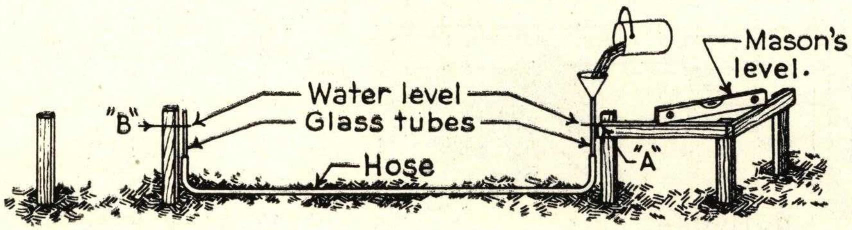
When length A equals length B the corners are square when opposite sides are equal.

3. Make length of wall to fit concrete masonry unit. 1 block and 1 vertical joint equal 16".

1

SET BATTER BOARDS AT SAME ELEVATION -

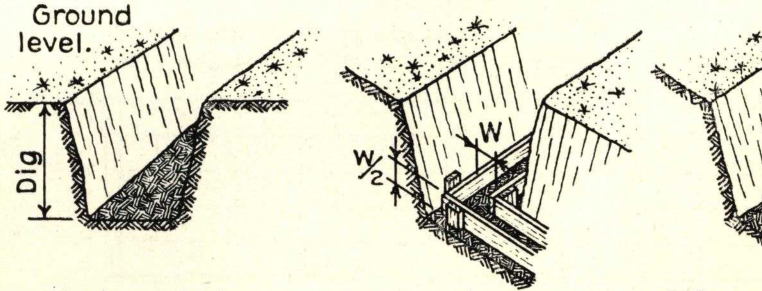
A hose with glass tubes in each end may be used to do this.



1. Set batter boards at one corner as at right.
2. Place hose as shown.
3. Fill with water until water level is at top of batter board "A".
4. Mark water level at opposite end "B" and set board to mark.

2

ADEQUATE FOOTINGS ESSENTIAL



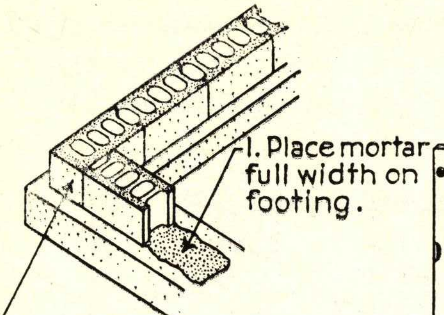
1. Dig trench down to firm soil below frost.
2. Make bottom of trench flat and level.
3. Forms to make footings proper size.

W = Twice masonry wall thickness.

4. Fill with 1:2¾:4 concrete.
5. Remove form after concrete hardens.
6. Sweep off top of footing before laying concrete masonry.

3

START LAYING BLOCK AT CORNERS

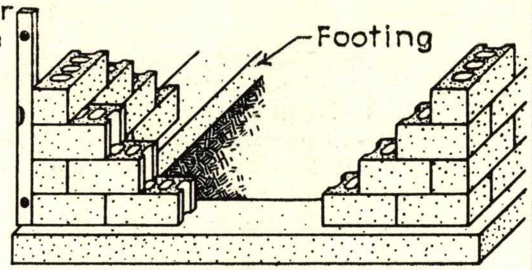


1. Place mortar full width on footing.

2. Use corner block with one flat end at corners.

3. Mortar placed on face shells only for succeeding courses.

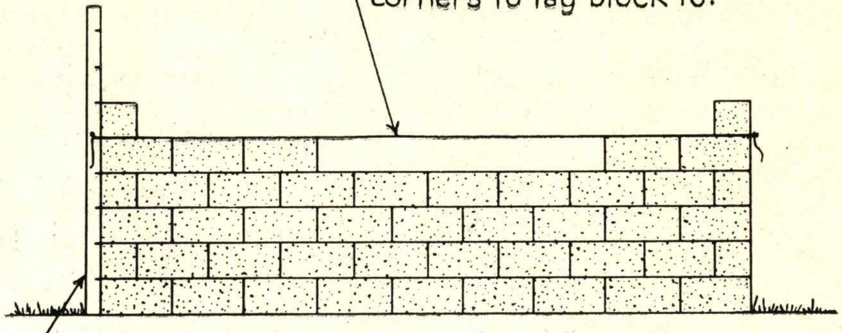
4. Make height of wall to fit concrete masonry unit. 1 block and 1 horizontal joint equal 8".



5. Build corners up using mason's level to keep plumb and straight.

4

BUILD WALL BETWEEN CORNERS



Stretch line between corners to lay block to.

A 1"x2" with saw marks 8" apart helps to space courses at corners.

Mortar joints are ⅜" thick.

Block should be dry when laid in wall.

5

MORTAR MIXES

Proportions by volume

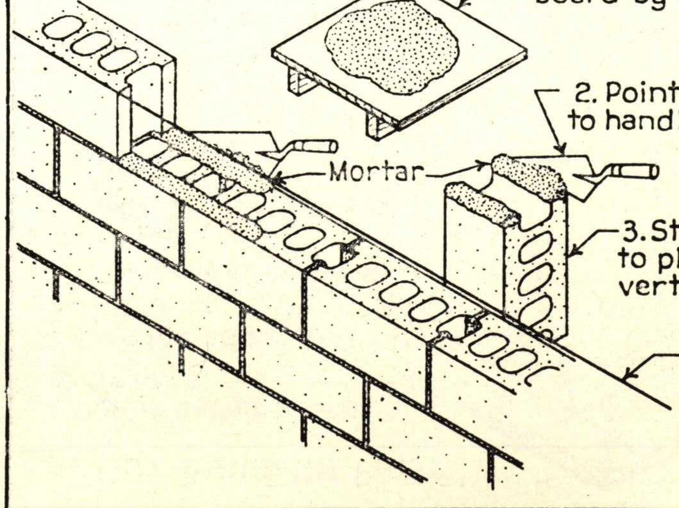
TYPE OF WALL	CEMENT	HYDRATED LIME OR LIME PUTTY	MORTAR SAND IN DAMP, LOOSE CONDITION
Ordinary	1-Masonry cement* or 1-Portland cement	0 1 to 1¼	2 to 3 4 to 6
Subject to extremely heavy loads, violent winds, earthquakes or severe frost action. Isolated piers.	1-Masonry cement* plus 1-portland cement or 1-Portland cement	0 0 to ¼	4 to 6 2 to 3

* Federal specifications SS-C-181b, Type II

Add enough clean water to make a workable mix.

6

APPLYING MORTAR



1. Mortar is placed on board by the helper.

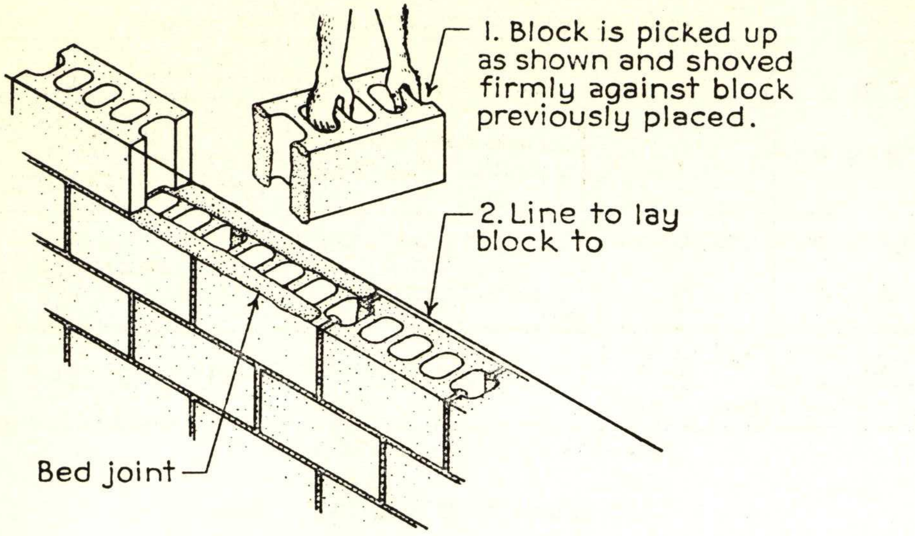
2. Pointed trowel is used to handle mortar.

3. Stand block on end to place mortar for vertical joint.

Line to lay block to.

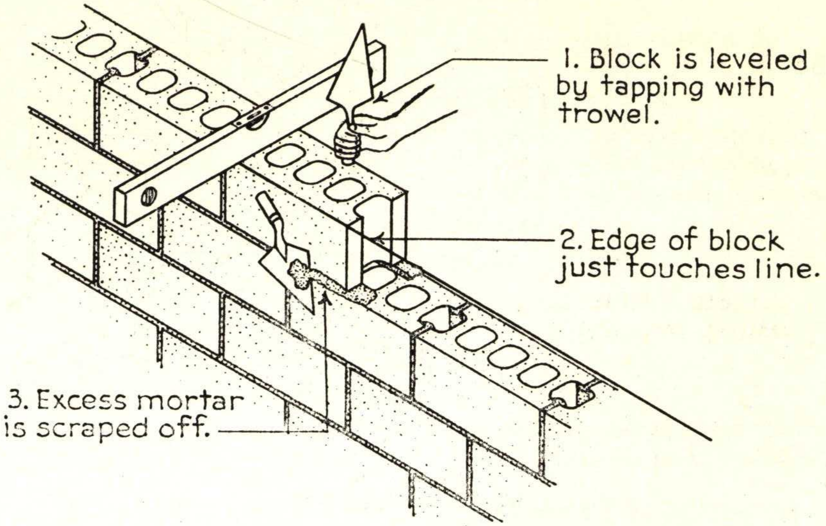
7

PLACING BLOCK


1. Block is picked up as shown and shoved firmly against block previously placed.
2. Line to lay block to
Bed joint

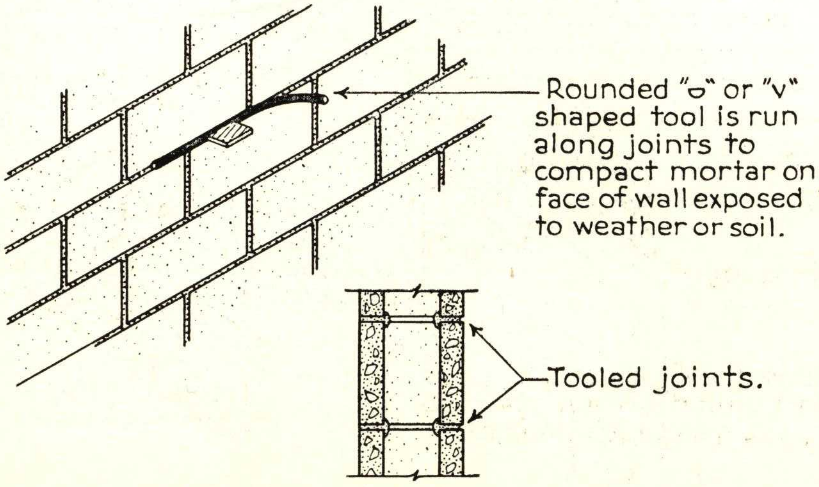
8

SETTING BLOCK


1. Block is leveled by tapping with trowel.
2. Edge of block just touches line.
3. Excess mortar is scraped off.

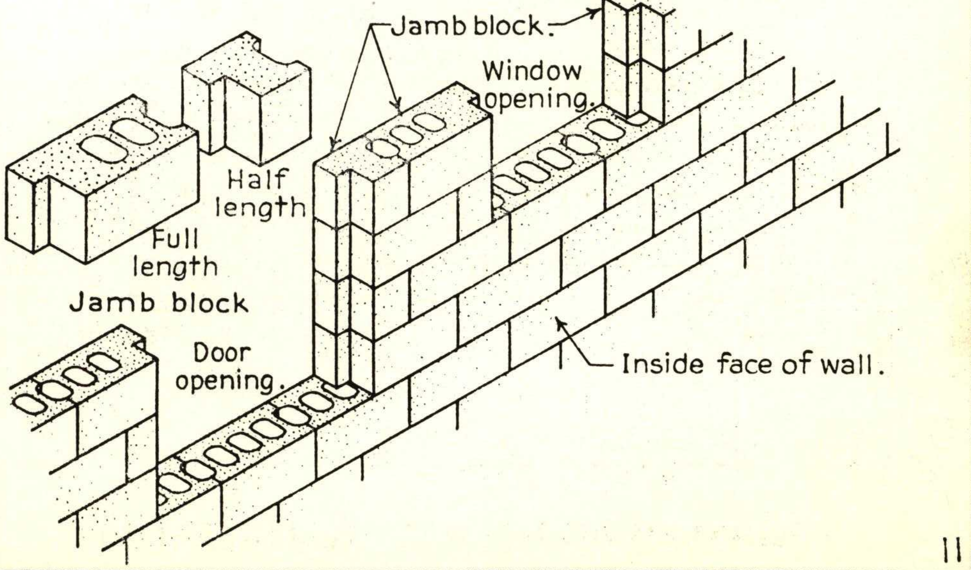
9

JOINTS ARE TOOLED AFTER MORTAR HAS BECOME QUITE STIFF


Rounded "ơ" or "v" shaped tool is run along joints to compact mortar on face of wall exposed to weather or soil.
Tooled joints.

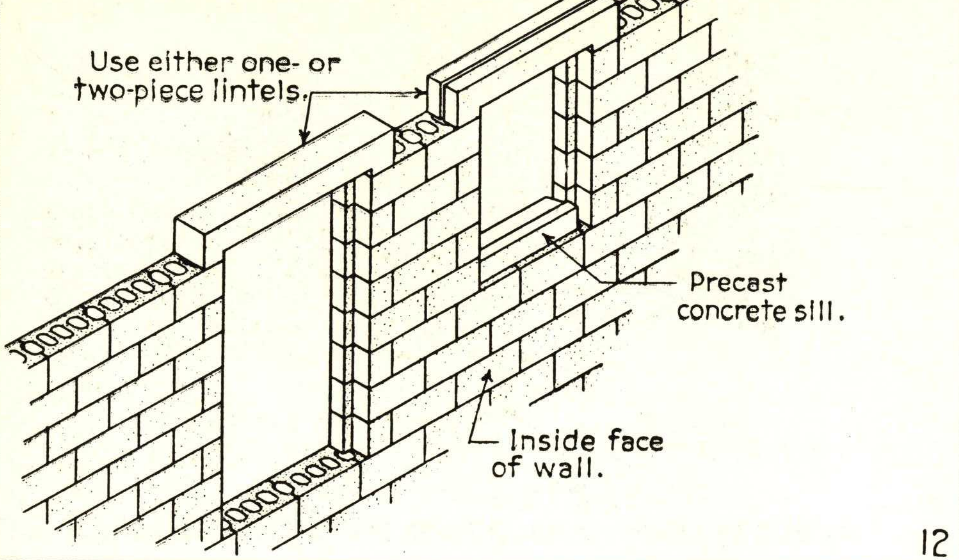
10

BUILDING DOOR AND WINDOW OPENINGS



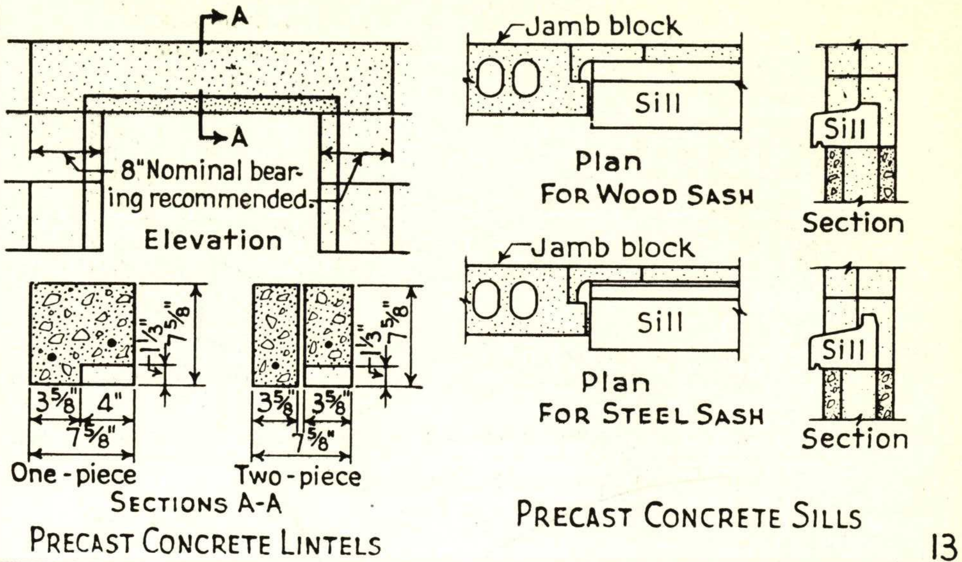
11

REINFORCED PRECAST CONCRETE LINTELS OVER OPENINGS



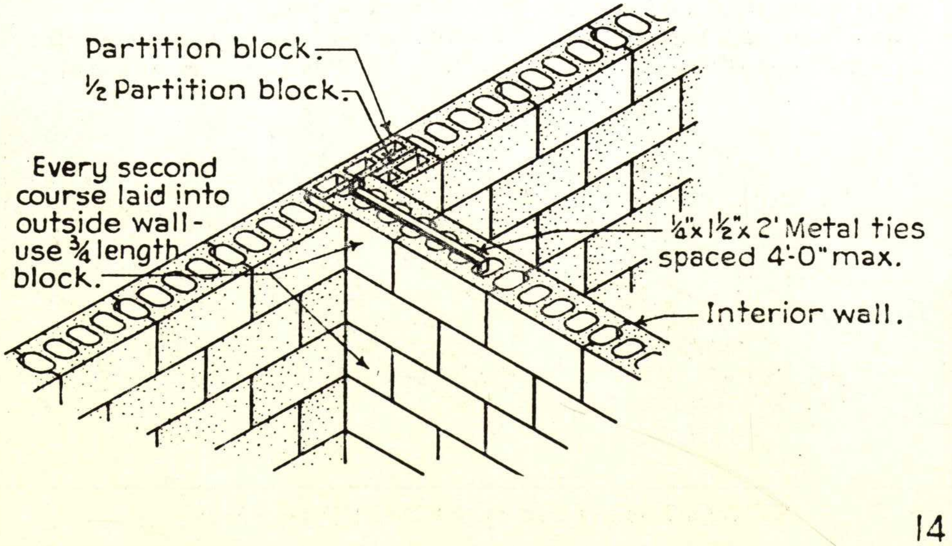
12

DETAILS OF PRECAST CONCRETE LINTELS AND SILLS



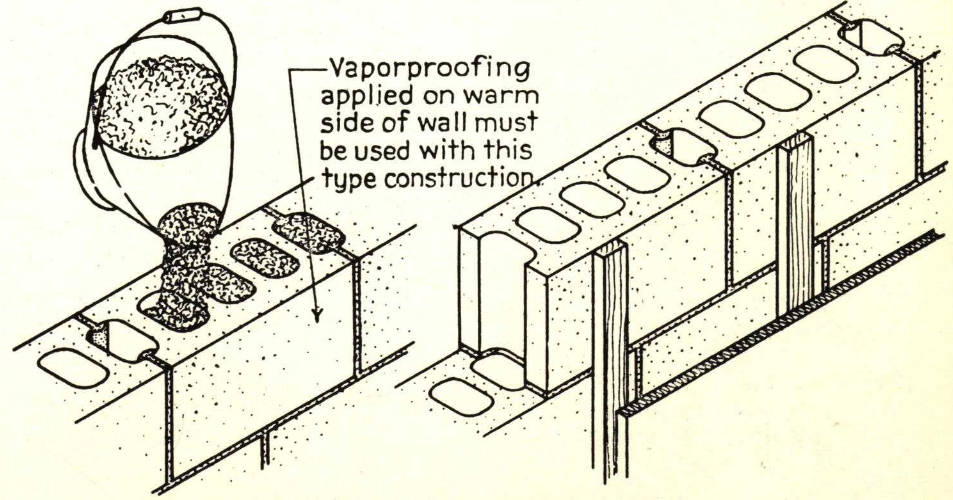
13

BONDING OF MASONRY WALLS


Partition block.
½ Partition block.
Every second course laid into outside wall- use ¾ length block.
¼"x 1½"x 2' Metal ties spaced 4'-0" max.
Interior wall.

14

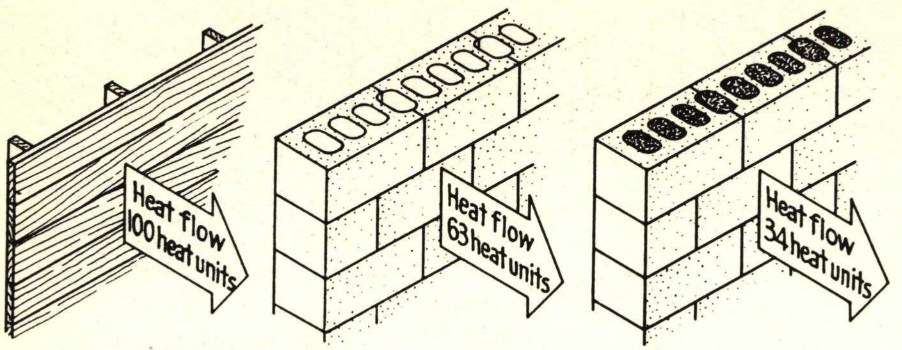
INCREASING INSULATION OF CONCRETE MASONRY WALLS


Vaporproofing applied on warm side of wall must be used with this type construction.

Filling cores with granular insulation. or Placing insulation board on furring strips.

15

RELATIVE HEAT LOSS OF THREE TYPES OF WALLS



Through siding alone.

Through 8" light-weight masonry wall alone. For heavyweight masonry 95 heat units.

Through 8" light-weight masonry wall with cores filled with granular insulation.

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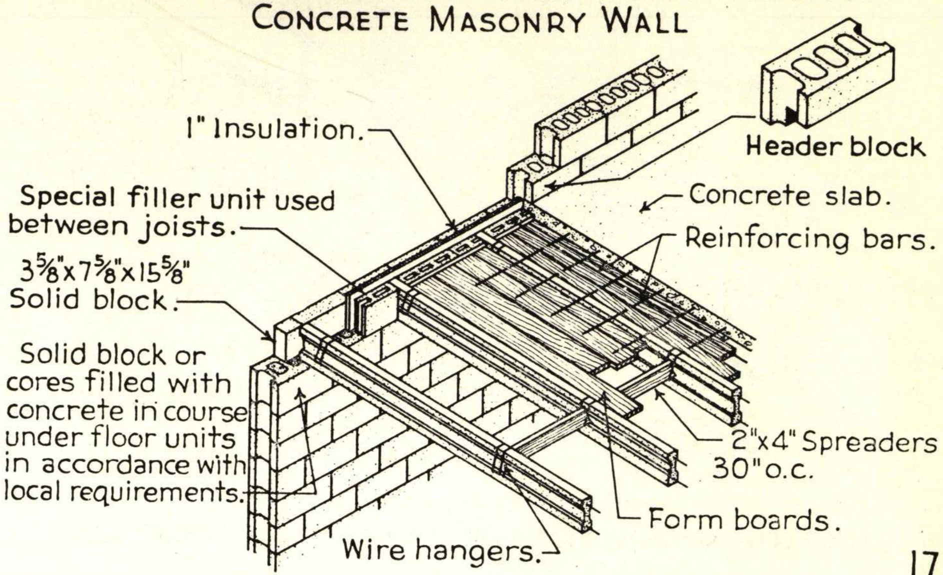
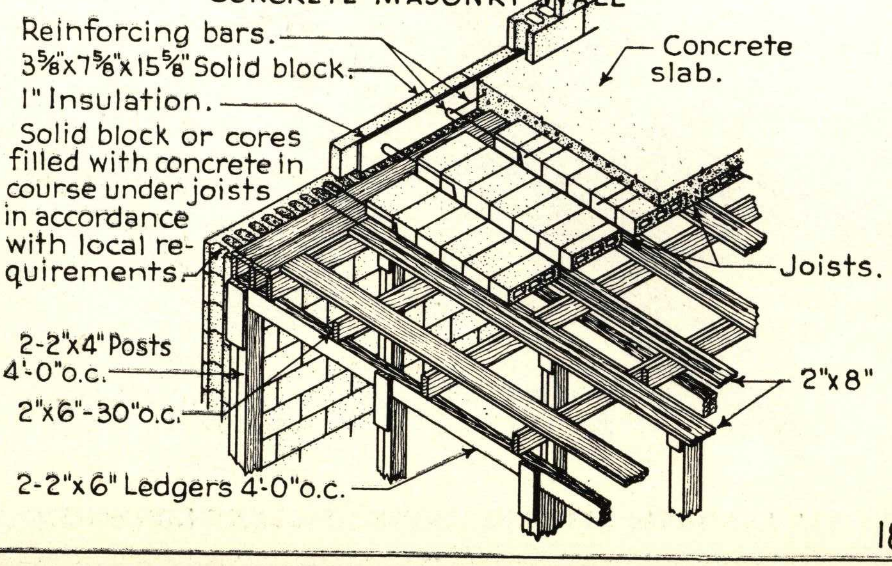
SUPPORTING PRECAST CONCRETE JOIST FLOOR ON CONCRETE MASONRY WALL


Header block
1" Insulation.
Special filler unit used between joists.
Concrete slab.
Reinforcing bars.
3⅝"x7⅝"x15⅝" Solid block.
Solid block or cores filled with concrete in course under floor units in accordance with local requirements.
2"x4" Spreaders 30"o.c.
Form boards.
Wire hangers.

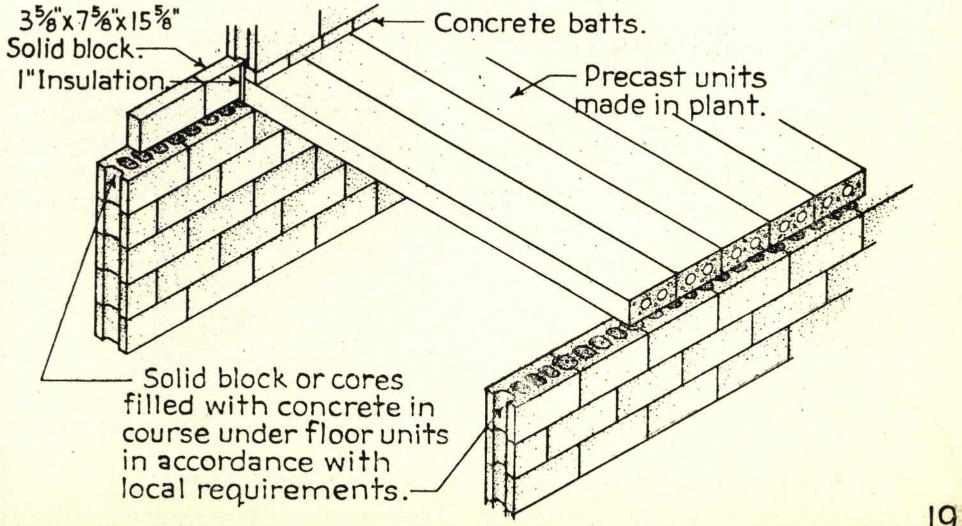
17

SUPPORTING CONCRETE BLOCK JOIST FLOOR ON CONCRETE MASONRY WALL


Reinforcing bars.
3⅝"x7⅝"x15⅝" Solid block.
Concrete slab.
1" Insulation.
Solid block or cores filled with concrete in course under joists in accordance with local requirements.
Joists.
2-2"x4" Posts 4'-0"o.c.
2"x8"
2"x6"-30"o.c.
2-2"x6" Ledgers 4'-0"o.c.

18

SUPPORTING CORED CONCRETE FLOOR UNITS ON CONCRETE MASONRY WALL


3⅝"x7⅝"x15⅝" Solid block.
Concrete batts.
1" Insulation.
Precast units made in plant.
Solid block or cores filled with concrete in course under floor units in accordance with local requirements.

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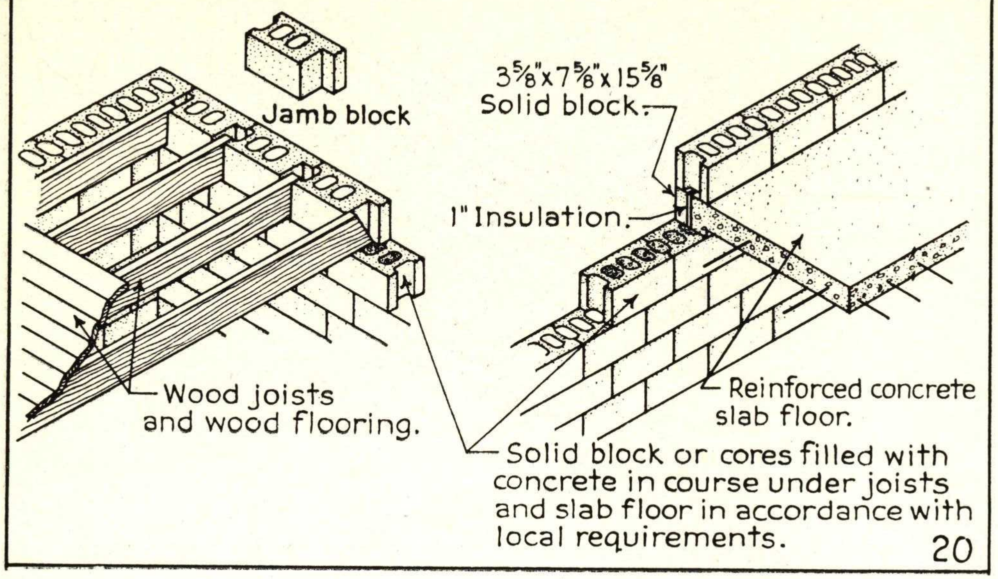
Wood or Concrete Floors on Concrete Masonry Walls



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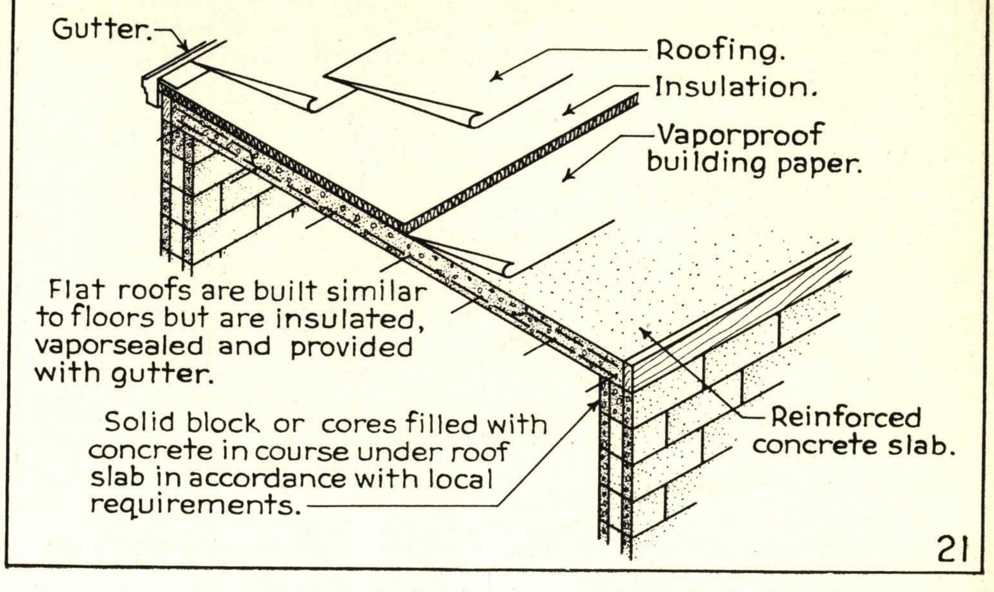
Flat Roofs on Concrete Masonry Walls


Gutter.
Roofing.
Insulation.
Vaporproof
building paper.
Flat roofs are built similar
to floors but are insulated,
vaporsealed and provided
with gutter.
Solid block or cores filled with
concrete in course under roof
slab in accordance with local
requirements.
Reinforced
concrete slab.

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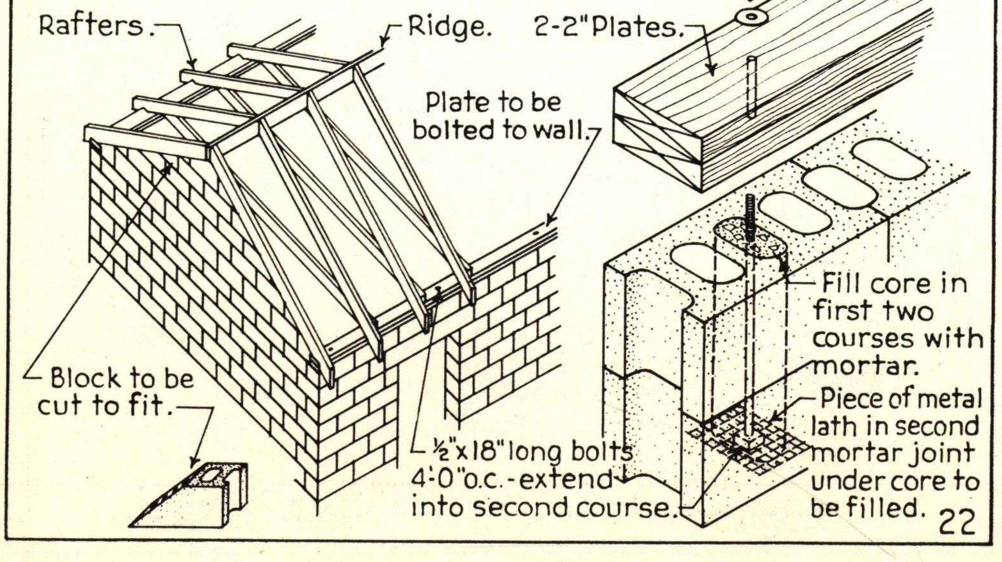
Construction of Wood Roof on Concrete Masonry Wall



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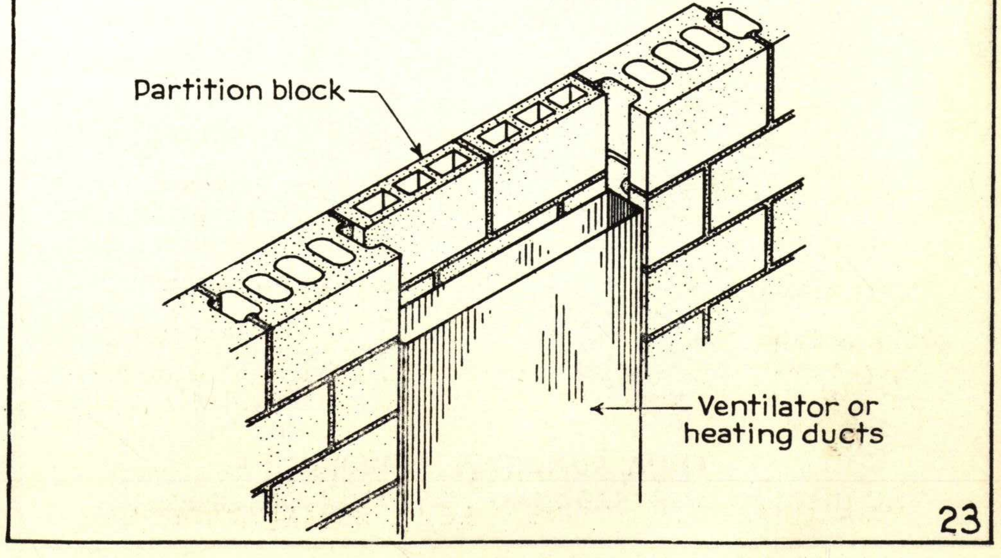
Ventilation or Heating Ducts May Be Built into Wall
One Method Shown Below



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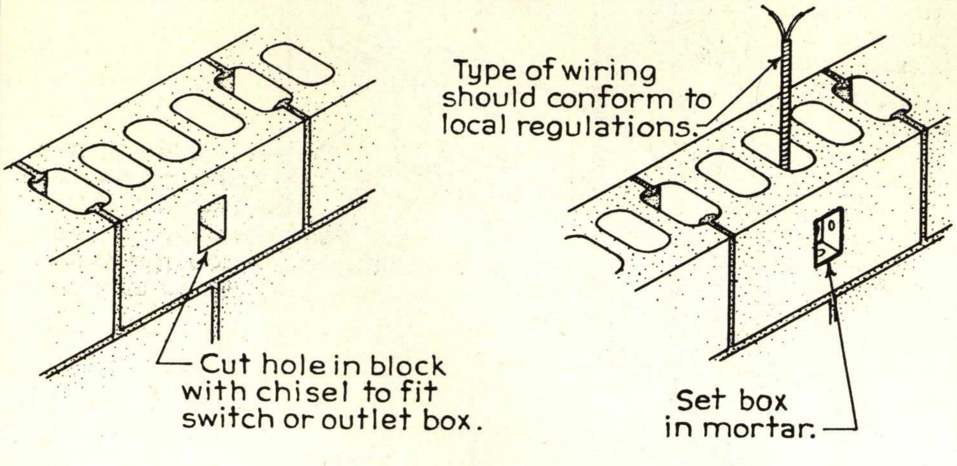
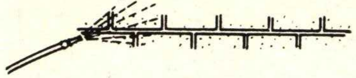
HOW TO INSTALL SWITCH AND OUTLET BOXES IN CONCRETE MASONRY WALLS


Type of wiring should conform to local regulations.
Cut hole in block with chisel to fit switch or outlet box.
Set box in mortar.
24

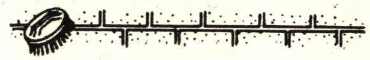
MASONRY WALLS MADE WEATHER-RESISTANT WITH PORTLAND CEMENT PAINT

1. Mix paint according to manufacturer's instructions.

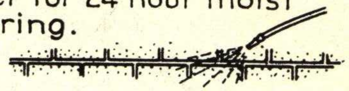
2. Dampen wall.



3. Scrub paint into surface with stiff brush.

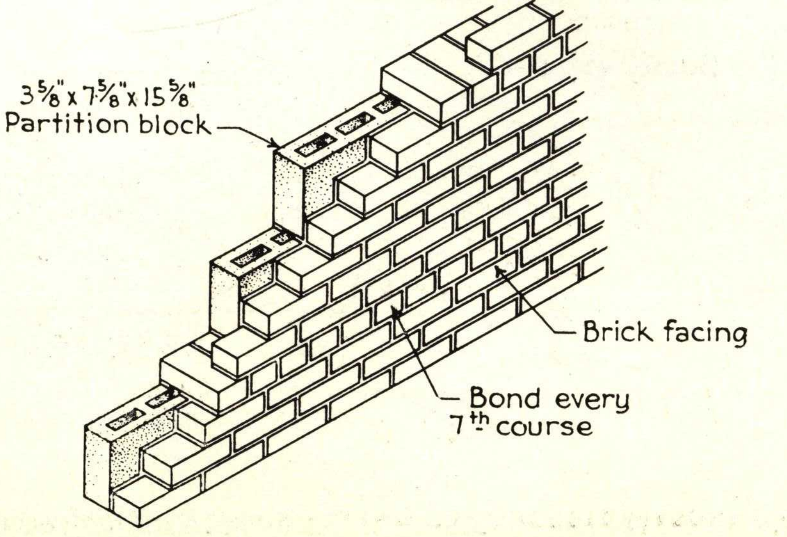


4. As soon as paint will not wash off keep wall wet for 24 hour moist curing.

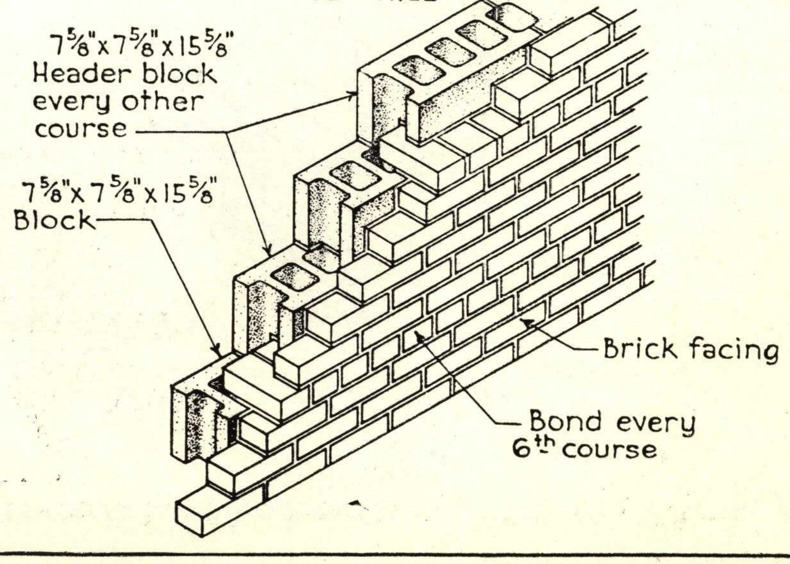


5. Second coat applied and cured in same manner.

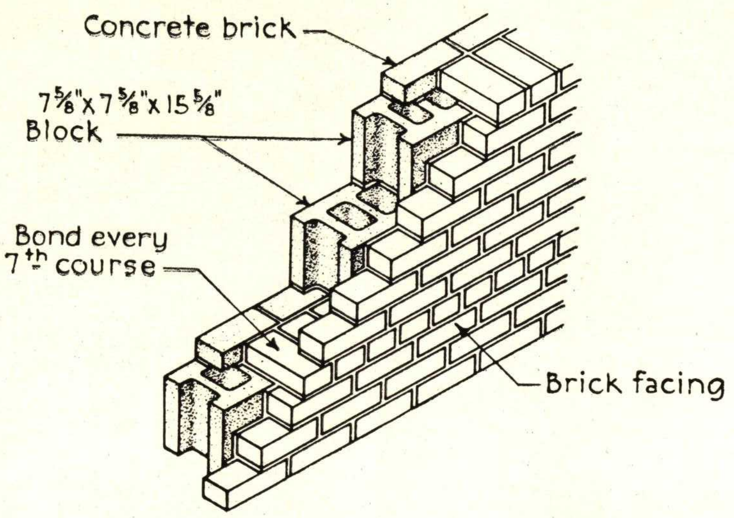
BONDING BRICK FACING TO CONCRETE MASONRY WALL
8" WALL



6TH COURSE BONDING BRICK FACING TO CONCRETE MASONRY WALL
12" WALL



7TH COURSE BONDING BRICK FACING TO CONCRETE MASONRY WALL
12" WALL



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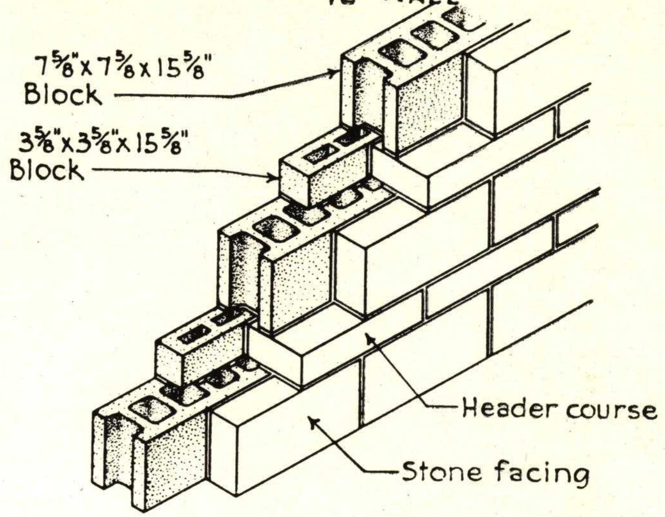
ONE METHOD OF BONDING STONE FACING TO CONCRETE MASONRY WALL
12" WALL



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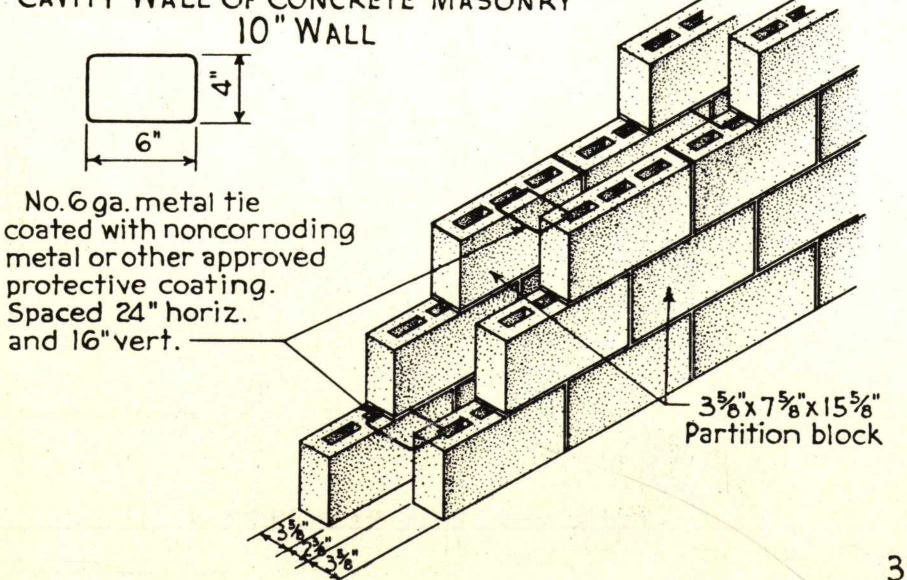
CAVITY WALL OF CONCRETE MASONRY
10" WALL



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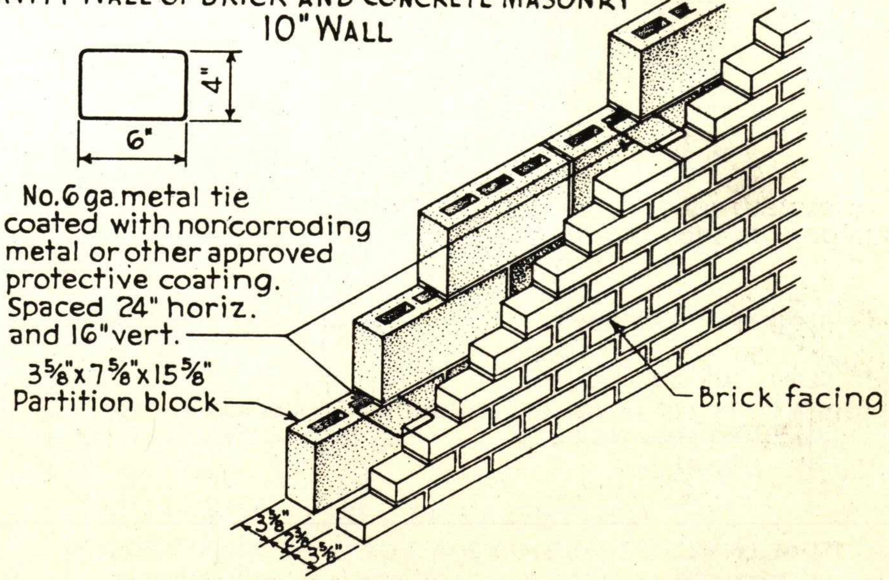
CAVITY WALL OF BRICK AND CONCRETE MASONRY
10" WALL



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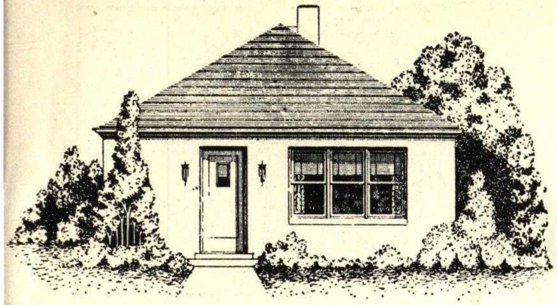
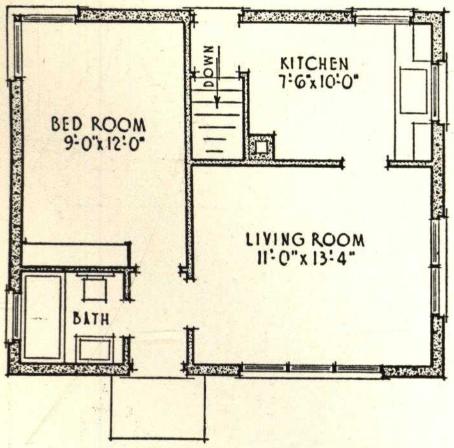
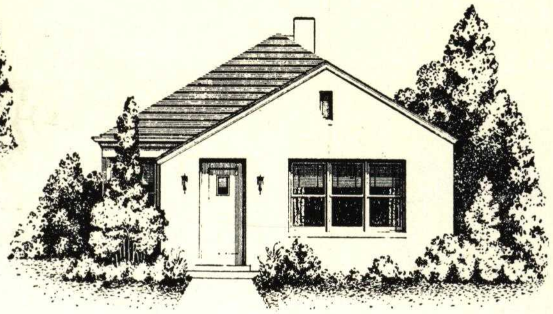
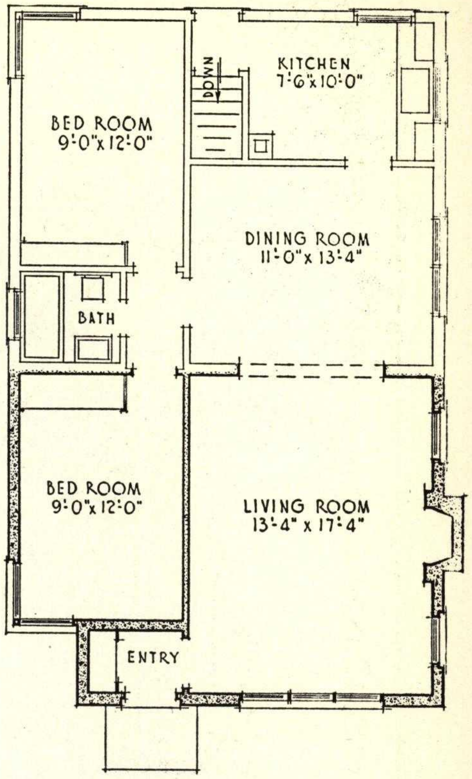


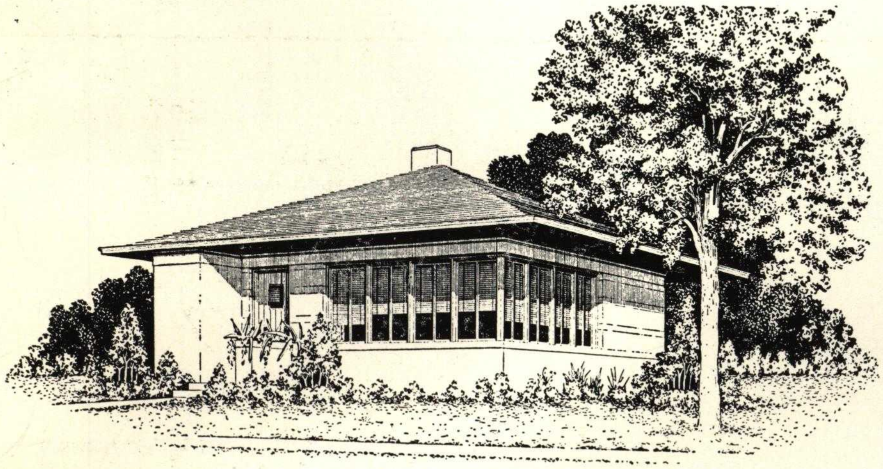
CUBAGE (*first stage*):
House...... 5,760 cu.ft.
Basement... 3,340 cu.ft.

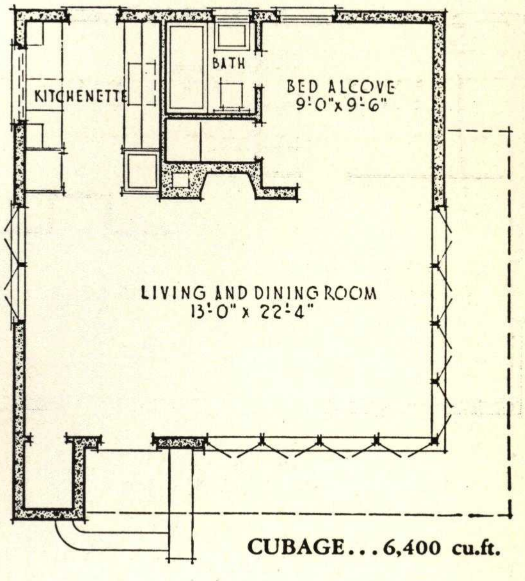


CUBAGE (*second stage*):
House..... 11,190 cu.ft.
Basement.. 3,340 cu.ft.

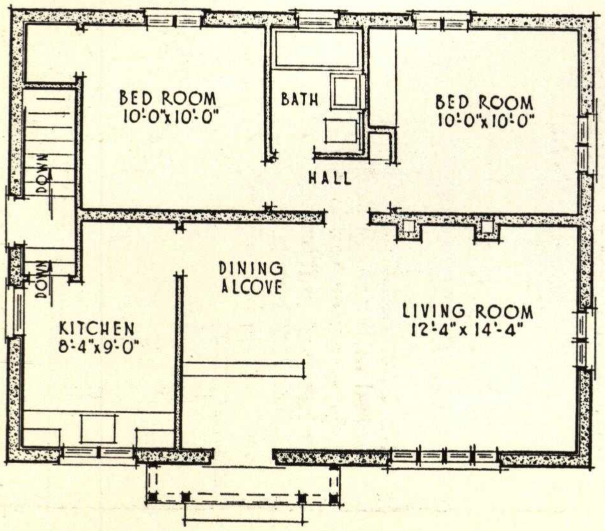




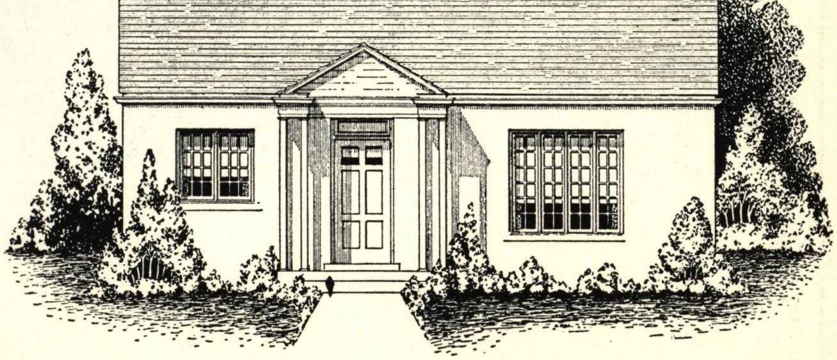


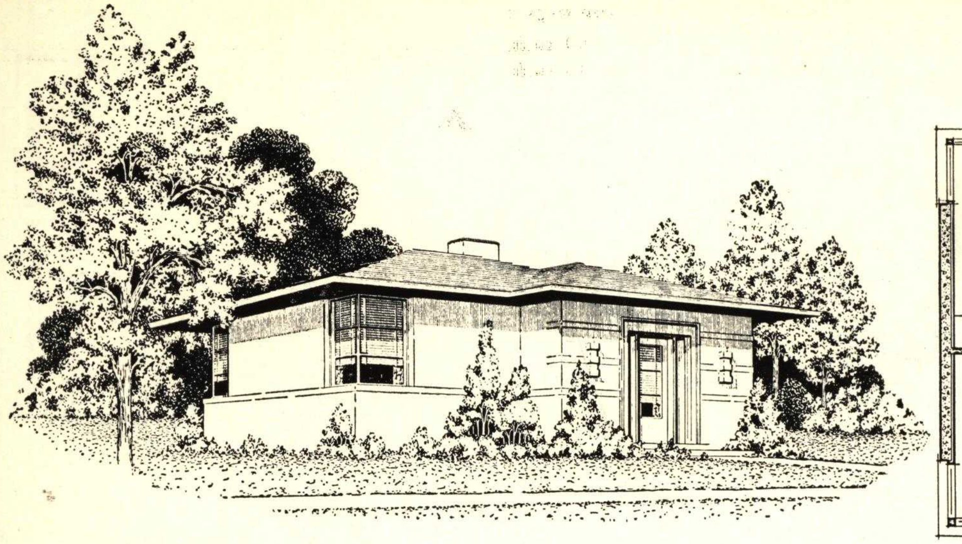


CUBAGE... 6,400 cu.ft.



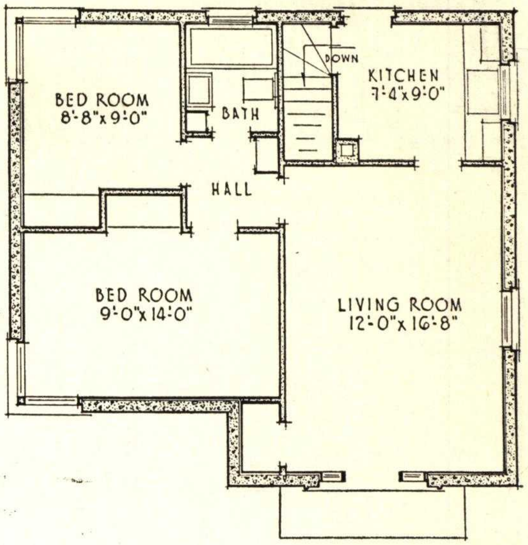
CUBAGE:
House..... 10,380 cu.ft.
Basement.. 6,400 cu.ft.





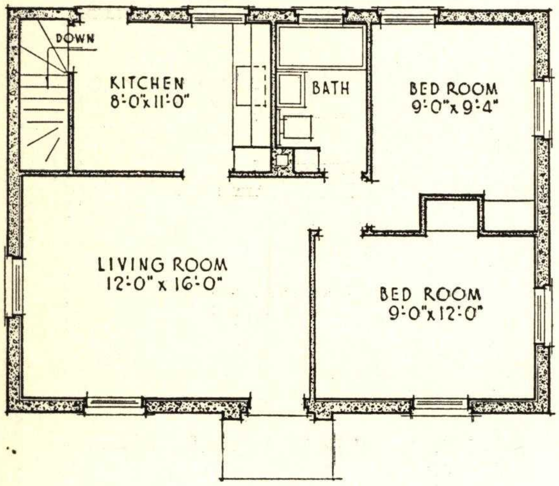
CUBAGE:

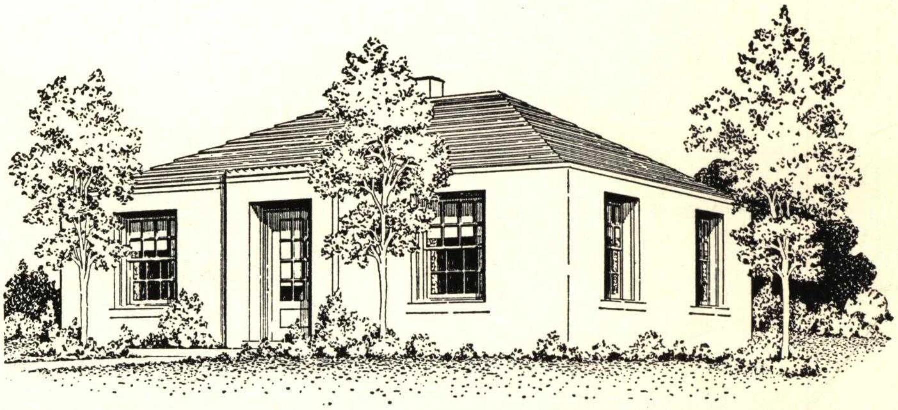
House......7,650 cu.ft.
Basement...5,560 cu.ft.



CUBAGE:

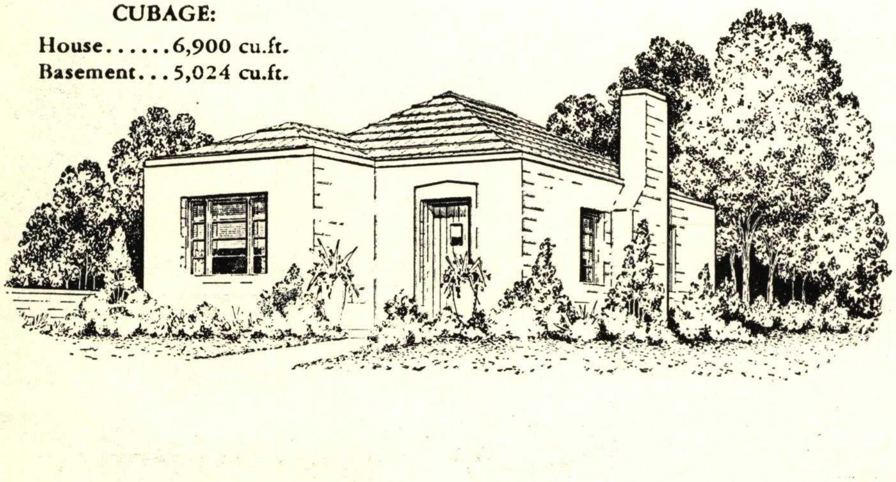
House......7,920 cu.ft.
Basement...5,280 cu.ft.

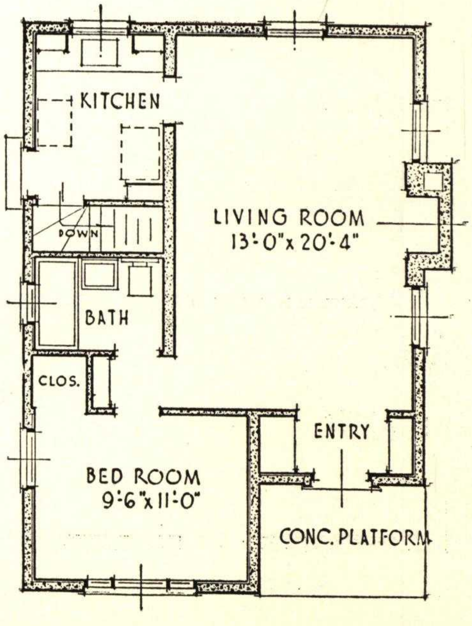




CUBAGE:

House......6,900 cu.ft.
Basement...5,024 cu.ft.





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